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AUTHOR Griffiths, Jose-Marie; King, Donald W.
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ABSTRACT

The objectives of the project described in this report were to provide specific, clearly defined options for Arizona libraries to share information and bibliographic resources, propose strategies for implementing the options, and present a phased implementation schedule for implementing them. The report begins with an executive summary which describes the principal study methods, identifies several types of resource sharing, highlights the benefits of resource sharing, profiles the current amount of resource sharing, and recommends strategies for implementing resource sharing in the future. The main body of the report is divided into four sections. Section 1 presents the background of the project, the long-range plan for Arizona libraries, and the methods employed in the project. Information is presented in Section 2 about the status of current interlibrary loan and reference referral services offered by Arizona libraries as well as their technology capabilities. Section 3 provides an economic analysis of interlibrary loan and reference referral, and section 4 discusses options for future resource sharing development. The report concludes with 5 appendixes and 49 tables of survey data. Appendixes include the scope of work from the RFP (request for proposals) from the State of Arizona; a glossary of terms and data collection forms for large and other public libraries, large and other academic libraries, school libraries, and special libraries; a statement of the reliability of the survey; and special analyses of the AILLC (Arizona Interlibrary Loan Center) and the State Reference Center. (MAB)

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A STUDY OF RESOURCE SHARING IN THE STATE OF ARIZONA: OPTIMIZING LIBRARY DOLLARS

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JULY 1990

**A STUDY OF
RESOURCE SHARING
IN THE STATE OF ARIZONA:
OPTIMIZING LIBRARY DOLLARS**

Submitted to:
Department of Library, Archives and Public Records
Phoenix, AZ 85007-2687

Jose-Marie Griffiths, Ph.D.
Center for Information Studies
University of Tennessee

Donald W. King
King Research, Inc.

KING RESEARCH, INC.
P.O. Box 572
Oak Ridge, TN 37831
(615) 481-0389

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EXECUTIVE SUMMARY

THE STUDY IS ADDRESSED TO GOALS AND OBJECTIVES OF THE STATEWIDE PLAN FOR ARIZONA LIBRARIES

The Arizona library community developed and endorsed a long-range plan for Arizona libraries. Goal 1 of that plan states:

A statewide network of public, school, academic and special libraries will support the needs of Arizona residents for quality library service.

Objective 1.1. further states:

An action plan for a statewide resource sharing network among all types of libraries will be developed and implementation begun.

As a result a competitive contract was awarded to King Research, Inc. to provide specific, clearly defined options for sharing information and bibliographic resources, document these options, propose strategies for implementing the options and present a phased implementation schedule for implementing the options.

THE STUDY WAS DONE THROUGH SURVEYS, COST ANALYSIS, SECONDARY RESEARCH AND EXTENSIVE PERSONAL COMMUNICATIONS.

The principal methods in the study involved:

- o **Formal surveys of Arizona libraries.** Public, academic, school and special libraries were surveyed using statistical sampling to identify patterns of resource sharing among libraries, type of requests, request and response mechanisms used, turnaround times, current extent of machine readable catalog records and current and planned availability of automation.

- o Economic analysis. Cost finding and analysis were performed for the Arizona Interlibrary Loan Center and the State Reference Center. Average costs of functions and services were established for these Centers and for requesting and providing services through an existing Arizona study and economic cost models developed from numerous in-depth studies by King Research. In particular, economies of scale were examined.
- o Analysis of secondary information. Arizona maintains excellent statistics of library services. These data and other reports were analyzed and incorporated into study results.
- o Communication with the library community. Communication included visits and interviews with State Library staff, AILLC and SRC staff, a special presentation at the annual Arizona Library Association meeting, a special meeting with county/district library directors, five meetings with the Resource Sharing Task Force, and discussions with members of the library community.

THERE ARE SEVERAL TYPES OF RESOURCE SHARING

Library sharing can involve many library resources such as:

- o Collections and materials through cooperative collection development, interlibrary lending, reciprocal borrowing arrangements, rotating and pool collections, and so on.
- o Systems and equipment such as online bibliographic searching, circulation systems, cataloging systems, integrated library automation systems, centralized computing, electronic mail, and so on.
- o Staff with special knowledge and skills such as reference referral, cataloging, consultants (e.g., automation, young adult, audiovisual, etc.), and so on.
- o Staff with capabilities to provide centralized operational functions such as acquisitions, physical processing, ILL verification and request processing, and so on.
- o Special programs such as continuing education for librarians, outreach to institutions, books by mail, and so on.

Such resource sharing for the most part is done to achieve economies of scale. That is, the average cost per unit of providing services (or performing library activities) is generally less when more services are provided (or shared). Throughout the years Arizona libraries (particularly public libraries) have developed resource sharing relationships through reciprocal arrangements among two or more libraries (e.g., reciprocal borrowing among Maricopa County libraries), centralized county or State centers (e.g., Cochise County and State ILL, reference and audiovisual centers) and through State Library (e.g., library development consultant services).

THE BENEFITS OF RESOURCE SHARING ARE SUBSTANTIAL

The overall goal of resource sharing is to provide every citizen of Arizona with unconstrained access to the world's literature. However there are also substantial economic consequences of resource sharing. For example, we estimate that it costs the Arizona library community (i.e., requestors, providers and funders) about \$1.6 million to engage in resource sharing through ILL. From in-depth studies performed by us elsewhere, we believe that it would cost the library community over \$4.0 million more annually to provide equivalent services through alternative means and it is likely that over one-third of the services simply would not be provided because of prohibitive cost. Furthermore, the additional cost to citizens to use alternative means is estimated to be over \$300,000 and nearly 80,000 hours of their time. Similar benefits might be achieved through other forms of resource sharing.

RESOURCE SHARING IN ARIZONA HAS NOT YET REACHED ITS POTENTIAL

The annual amount of interlibrary borrowing is estimated to be 113,900 items and amount of reference referral is about 12,000 requests filled in the State. Both forms of resource sharing are well below national norms. The low amounts of interlibrary borrowing is partially attributable to strong collections in some localities and to some reciprocal borrowing among communities. However, we believe that substantial additional savings to Arizona libraries and citizens can be achieved through (1) increased knowledge and awareness of resource sharing, and (2) enhanced networking capabilities. All types of libraries can utilize

these valuable services more extensively. Amount of resource sharing and the current savings of \$4.0 million could easily double in the State.

School libraries in particular should take more advantage of resource sharing of all types. Arizona school libraries do less than one-fifth the amount of interlibrary borrowing that we have observed elsewhere. Only 39 percent of school libraries participate in this activity. One-fourth are unaware of these capabilities in the State. The potential is there, but mechanisms need to be set forth for the school librarians to develop resource sharing arrangements among themselves and with other types of libraries. Over 40 percent of the school librarians said they definitely would use resource sharing if permitted by local board policy.

OPTIONS TO CURRENT STRUCTURE AND USE OF TECHNOLOGY CAN INCREASE RESOURCE SHARING AND MINIMIZE ECONOMIC COSTS

Because of economies of scale we believe that the optimum structure for resource sharing through ILL and request processing is to utilize a combination of State centers and intermediate centers which have sufficient volume to achieve economies of scale. When counties or regions have sufficient volume, libraries should use intermediate centers which process and fill requests or forward them to the State center(s). Otherwise libraries should use the State centers directly. This system is referred to as a "hybrid" network because it combines elements of several structures.

We examined three options regarding technology for interlibrary loan in a hybrid network:

- o OCLC with Group Access
- o CD-ROM
- o linked integrated library systems

In addition to the recommendation of the hybrid structure, we recommend the following ILL protocols:

- o libraries with access to OCLC and RLIN should continue to use them for interlibrary loan
- o AILLC and county and district libraries handling a sufficient volume of interlibrary loan requests should become selective users of OCLC
- o libraries with a sizeable volume of interlibrary loan requests annually should become selective users of OCLC
- o all other libraries should submit their interlibrary loan requests to AILLC for processing

As indicated above, we recommend the use of OCLC's Group Access Capability for a statewide database of library holdings. We recommend that this database be set up to incorporate the SOLAR database. Furthermore, we recommend that when the SHAREPAC-CD-ROM product is released by OCLC (anticipated during Fall 1990) the possible use of the CD-ROM version of the database with its tie-in to the interlibrary loan subsystem be considered for some Arizona libraries.

Finally, to take further advantage of economies of scale and of the collection of materials available at the Phoenix Public Library, AILLC and SRC can be used collectively more effectively. It appears that there is substantial overlap between difficult subject requests to AILLC and simple reference requests to SRC that are filled by documents. Costs could be reduced by greater cooperation between AILLC and SRC, setting clearer protocols to requesting libraries and/or having either AILLC or SRC process all such requests. (Note that since the study was performed SRC is being merged with the reference services of the new Research Division).

LIBRARIES SHOULD UNDERSTAND AND USE RESOURCE SHARING MORE EXTENSIVELY

Libraries should examine how resource sharing of all types can be used to improve operations and services and/or reduce costs. It is not necessary for all such resource sharing to be state wide or funded by the State. In fact, much resource sharing should be "local" or developed through arrangements of convenience. Furthermore libraries should develop sound

cost data and other arguments that can be used to convince funders of the benefits achieved through resource sharing. The State Library can be a valuable resource for providing local libraries with examples of resource sharing and evidence of economic and other benefits.

Interlibrary borrowing and reference referral are not "free" and, therefore, requesting libraries must carefully consider using these resource sharing services. Typically ILL costs to borrowing libraries is about \$4.78 per loan and reference referral costs requesting libraries about \$6.38 per request. On the other hand, these resource sharing services provide libraries of all types with substantially greater service opportunities for their patrons. However, evidence suggests that Arizona libraries should be taking greater advantage of these services. Interlibrary borrowing should be an integral part of collection development. If technology options are exercised in the State, the opportunities will be even far greater in the future for expanding services and saving costs. Librarians should learn about these opportunities and take advantage of them.

PROVIDING LIBRARIES AND CENTERS SHOULD RECOGNIZE THE IMPORTANCE OF THEIR SERVICES AND THE VALUE OF HIGH QUALITY AND TIMELY SERVICE

The cost of providing interlibrary loans and reference referral extends beyond application of resources and funds. Lending libraries, for example, sometimes have materials out when needed by patrons and sometimes items are lost or returned damaged or soiled. However, the value of resource sharing thorough ILL and reference referral far exceeds the economic and other costs. Thus, services should be provided with high quality and as expeditiously as possible reflecting user requirements. Use and value of services are clearly dependent on service performance. Timeliness of interlibrary loans in Arizona is better than observed elsewhere, due partially to fast AILLC responses. Response times for reference referral are greater and slightly higher than norms established elsewhere. We did not examine quality of reference referral in Arizona.

FUNDING BODIES HAVE AN OPPORTUNITY TO GAIN TREMENDOUS LEVERAGE ON THEIR LIBRARY FUNDS

This study and numerous other studies have clearly demonstrated that library funds can achieve substantially more benefit than by merely distributing all funds directly to libraries. There are three ways that additional leverage can be accomplished. The first way is by funding (or supporting) services (or activities) in which resource sharing among libraries takes place. This is exactly what is being done with funds directed toward resource sharing activities such as interlibrary loan and reference referral. Evidence, as shown above, suggests that such consequences might be two to three times greater than costs. Thus, the funds are leveraged to accomplish far more than if the funds are used for in-house services. The second way involves services (or activities) in which economies of scale can be achieved. We show that even further savings can be obtained for interlibrary lending and reference referral by having large libraries and centers perform some functions for small libraries because of economies of scale. In Section 3.6 we demonstrate that the public libraries alone could save lending libraries and borrowing libraries at least \$185,000 by shifting activities to larger centers to achieve economies of scale. Here it is abundantly clear that large organizations can provide some services for a fraction of the cost of small libraries. Thus, if these services are funded to support small libraries the funds are leveraged to accomplish far more. The third way that leverage can be achieved is the optimum use of technology which is discussed in Section 4.

One problem with shifting functions to intermediate centers and a State center is that a few libraries would end up being large net lenders. Based on 1988-1989 public library statistics, only Cochise and Pima counties and Glendale, Mesa, Scottsdale and Tucson public libraries exceed or come close to a "critical mass." Incentives could be achieved for lending libraries through reimbursement for net lending. If the above two counties, four public libraries and AILLC (PPL) are involved there would be 10,081 additional filled loans that are not presently reimbursed through AILLC (i.e., 57,833 minus 47,752 which includes: - 10,416 (Cochise) - 2,446 (Glendale) - 3,923 (Mesa) - 5,386 (Phoenix) - 823 (Scottsdale) - 230 (Tucson/Pima) - 24,528 (AILLC)). Note that AILLC (PPL) would be reimbursed only for net loans and the processing of requests for referral through OCLC. The second problem is that

the State funds, in effect, largely support small public libraries (and other borrowers from the reimbursed net lenders). This discrepancy can be overcome by allocating some funds to help build the collections (say, non-fiction) of designated net lending libraries. Also, there are always small "pockets" of unique collections (e.g., dealing with Indian or local culture) that need to be accommodated and provided to Arizona libraries through ILL.

Academic and special libraries should be encouraged to continue to serve as both borrowers and lenders. Large academic net lenders would also be reimbursed for their net lending to Arizona libraries. School libraries need to be encouraged to participate more extensively in interlibrary lending. Evidence suggests that many are unaware of the opportunity and benefits to be achieved through interlibrary loan and others simply do not participate. Evidence from the survey suggests that few school libraries, if any (none on the survey responses) come close to operating at the "critical mass." However, there is no automated union list or central comprehensive collection of education-related materials which can be used to identify and locate needed materials. Thus, school libraries must rely on public and academic libraries having OCLC, WLN or similar capabilities to verify, locate, fill or refer requests. They should be encouraged to do so in order to achieve the benefits of economies of scale.

A BLUEPRINT FOR NETWORK DEVELOPMENT IN ARIZONA

From the results of the various analyses performed, we recommend that a hybrid structure for a statewide interlibrary loan network be developed. This structure is seen as providing the best overall system for interlibrary loan. It allows libraries that have invested in the use of automated systems and services to take advantage of them, and it allows libraries that do not have the financial or staff resources to acquire or use those technologies a mechanism for participating in the system. Furthermore, it allows libraries in Arizona to achieve and take advantage of economies of scale associated with centralized operations.

This recommendation, however, should be implemented with full recognition that a system or network of participating organizations (in this case libraries) is in an ongoing state

of change. Such change can include the addition of more libraries as active participants in the system, the adoption of automated systems and services by libraries that previously were unable to acquire or develop such capability, the upgrading of existing automated systems and services, the development of a variety of interlibrary cooperative arrangements as needs arise and external conditions and influences dictate, etc. In the long-term, we envisage that more of the interlibrary loan request processing will be decentralized to the individual library level as databases that support bibliographic verification and location of needed materials develop.

In preparation for this evolutionary path and to ensure that Arizona libraries are positioned to take full advantage of technological and other developments, a blueprint for library automation and networking has been drawn up. This blueprint is based on existing patterns of library automation in Arizona and on preliminary studies of the feasibility of developing a statewide telecommunications network¹. Also, Arizona libraries should note progress in development and implementation of the National Research and Education Network (NREN). This proposed network is for electronic highways which link research and education institutions thorough telecommunications.

A number of libraries in the state have implemented automated systems. Some of these systems support single functions, such as acquisitions, circulation, etc. Other systems are fully integrated library systems supporting multiple functions including acquisitions, circulation, online public access catalog, serials control, etc. Some of the automated systems currently in place support the MARC record format for bibliographic data, others do not. For future interconnectivity, the following guidelines are recommended:

- o Automated systems should be selected to include the following criteria at a minimum:
 - ability to input and output MARC - formatted bibliographic records
 - commitment by the system developer/vendor to implement OSI standards as they become available

¹Report for a Statewide Network. Prepared by: Telecommunications International, Inc. for Arizona Education Telecommunications Cooperative. January 1990

- availability of an online public access catalog module with a variety of search features, including author, title, subject and keyword access. (Note that this module does not have to be implemented immediately).

Libraries with automated systems should ensure that their systems meet these minimum guidelines; if not, they should make every effort to upgrade their systems. In some cases this will require the purchase of hardware and/or software; in other cases it will require working with vendors to consider upgrades to their systems. Libraries that have not yet automated should take care to ensure that systems they acquire do meet these minimum guidelines.

The blueprint depicts a future in which libraries with automated, integrated library systems (meeting the minimum guidelines) have interconnected their systems into a network. The users (be they library staff members or library users) will be able to search their own libraries' catalogs for needed materials and, if they fail to find what they are looking for, they will be able to search the online catalogs of other libraries participating in the network. Ideally, the users should be able to formulate their queries on their own local library systems and, if unsuccessful in their local searching, they should through a single command or function keystroke be able to transmit their queries to other systems on the network. The users should not have to reformulate their queries, nor direct their transmitted queries to specific library systems. The network should be sufficiently "intelligent" to take the queries, reformulate them into the query languages needed by the other systems (in fact, this will most likely be achieved through a common query language for online catalogs which will form a part of one of the two top layers of the OSI standard protocol), and display the libraries holding materials that match the query, plus the current circulation status of those materials. In a sense, it should not be of concern to the user how and from where the network pulls this information. However, from a practical standpoint, it may be desirable for the list of identified holdings to be organized by proximity to the user's own library, or by size of library, or by some other criteria according to network and resource sharing protocols in effect at the time. Once needed materials have been identified and located, the users could then place requests for those materials through the network by use of a single command or function key stroke. (This could be implemented by means of a "special" hold on an item, or by an interlibrary loan capability). The users

should be able to designate whether they would like the requested materials delivered to their own local libraries, or set aside for pickup.

The interconnections needed to result in the above scenario are not purely technological in nature. Also needed are interlibrary cooperation policies - what is to be shared, who can share, what constraints are there, what are the respective roles and responsibilities of the cooperating parties, etc. Finally, protocols and procedures for sharing need to be established. These are generally designed to ensure an equitable distribution of effort and to guard against misuse of the agreements.

Libraries that are currently automated should start to discuss possible interconnection arrangements (at the technological, policy and protocol levels). Potential problem areas and constraints should be identified and possible solutions to overcoming them should be explored. The results of these discussions should be submitted to the statewide resource sharing committee for consideration in the development of the statewide resource sharing network.

The development of a fully interconnected network of libraries throughout the state must proceed in a step-by-step manner. In considering the current state of library automation in Arizona there appear to be clusters of libraries which could begin to investigate the possibilities of interconnection. These clusters, as might be expected, are formed around the major population centers in the state: Phoenix, Tucson, and Flagstaff. Phase I network development would involve the interconnection of automated libraries within these clusters. Phase II would enhance the network through the interconnection of these primary clusters. Phase III would involve the development of secondary clusters and/or the addition of more remote libraries to the primary clusters. Phase IV would link the secondary clusters to the primary clusters. These phases of development are shown conceptually in Figure 1.

These phases of development fit well into the recommendations for the statewide telecommunications network. The recommendation is for a statewide network to be based on a combination of technologies - satellite, microwave, Instructional Television Fixed Services

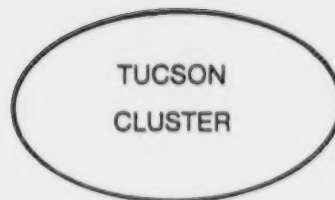
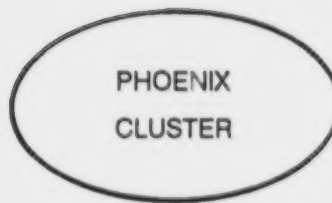
(ITFS), fiber optics, computer, telephone and (where possible) cable TV to provide video, voice and data communications services to the entire state. This suggested configuration makes use of technologies which are already in place and adds a satellite and a land-based component for full broadcast video, compressed video and high speed data transmission. The land-based portion of the infrastructure would provide for connectivity between the primary hubs of Flagstaff, Phoenix and Tucson, and then for connectivity from each primary hub to each secondary hub location.

It is worth noting that one of the next steps in the development of a statewide telecommunications network is the establishment of pilot telecommunications projects. Since statewide interlibrary loan and reference referral have already been identified as potential applications for the network, libraries (particularly automated libraries) should begin to plan possible pilot projects to demonstrate the need for and usefulness of the proposed telecommunications network.

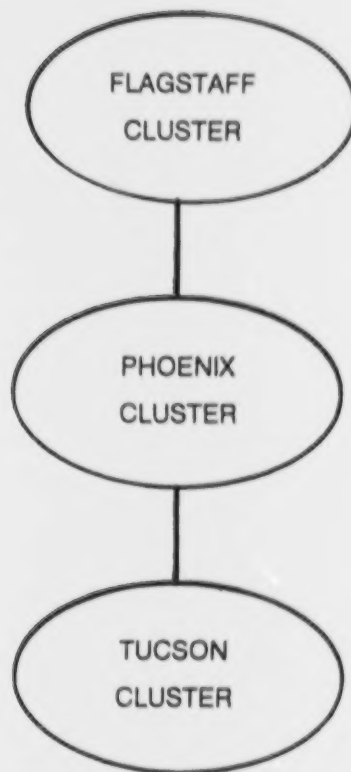
Figure 1

PHASES IN THE DEVELOPMENT OF A LIBRARY NETWORK IN ARIZONA

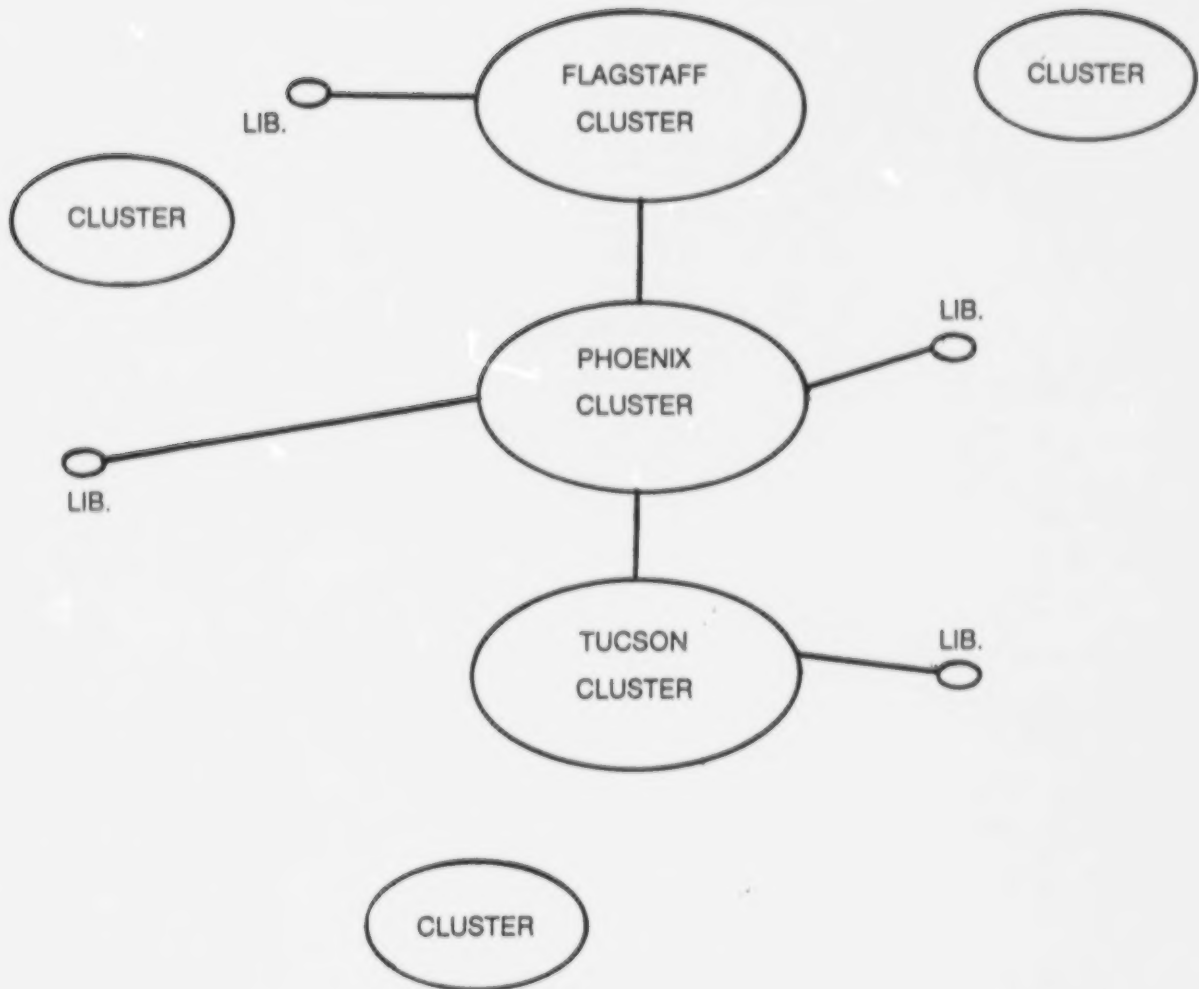
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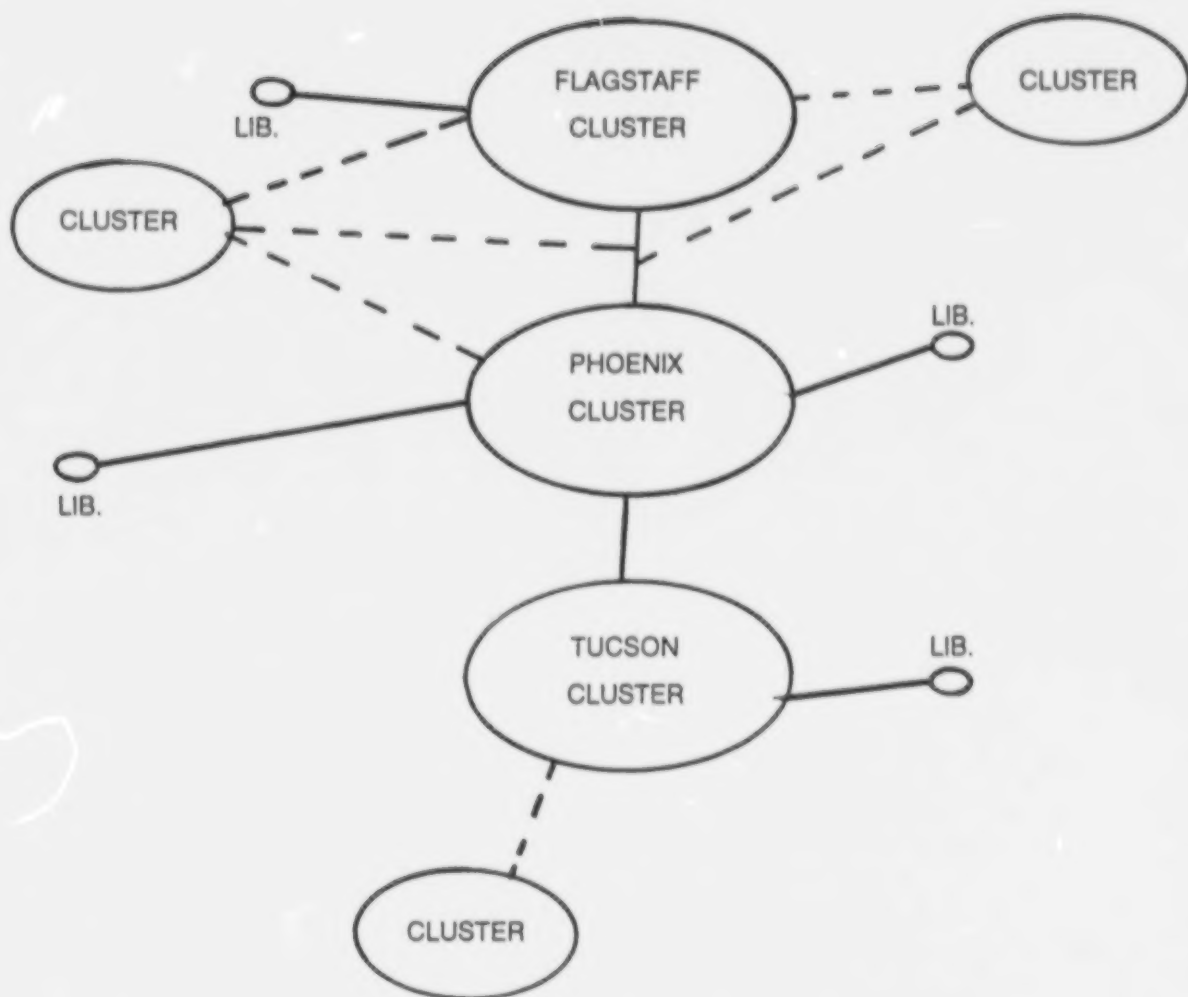
PHASE II



PHASE III



PHASE IV



STRATEGIES FOR IMPLEMENTING RESOURCE SHARING

The following strategies for implementing the recommended resource sharing in Arizona are recommended:

- o In order to achieve the full benefits of resource sharing there must be a bridge between the Department of Education and State Library. Legislation should be enacted to establish such a bridge through a formal Commission and a formal funding mechanism.
- o The State Library should establish a Resource Sharing Committee with representation of all types of libraries. The Committee should be charged with the responsibility for overseeing the implementation of recommended resource sharing, for monitoring progress made towards that end and for reviewing new options and opportunities as they arise.
- o The Resource Sharing Committee should ultimately become a Resource Sharing Commission through the legislative process.
- o There should be pilot programs of several kinds of resource sharing (i.e., ILL, reference referral, operational functions, etc.) among school libraries to demonstrate improvements in services and economies of scale. Assuming such improvements, funding for statewide resource sharing among school libraries and with other types of libraries should come by reallocating existing Department of Education funds.
- o The State Library should enhance resource sharing of all kinds among libraries of all types by providing information and data concerning exemplary examples and evidence of economies of scale and other benefits.
- o The Resource Sharing Committee should elect an ILL subcommittee to develop/revise the interlibrary loan code/protocols for Arizona libraries. The new code/protocols should include state-of-the-art practices, procedures, standards, etc. It is suggested that the subcommittee review recently revised codes/protocols from other states for relevance to the Arizona developments. In addition to describing interlibrary loan policy and procedural requirements, the code/protocols should also identify materials which should **not** be considered eligible for loan (e.g., rare or valuable materials, recent acquisitions, reference materials, materials which can be purchased for under a certain price etc.)
- o The State Library should develop, or have developed, an interlibrary loan manual and workshop. These should be addressed to the least sophisticated library as well as to the most sophisticated library. Workshops should be offered frequently so that representatives of all Arizona libraries have the opportunity to

attend. The education and training of library staff to the benefits of interlibrary loan and the procedures for participating in the interlibrary loan network are critical to the successful implementation of the network.

- o The State Library should develop a Request for Information or Request for Proposal for the building of and access to a statewide database on OCLC. State Library staff should work with AMIGOS and OCLC representatives to investigate the various options open to Arizona libraries. Note that the Maricopa County Library does not belong to AMIGOS (although it does belong to OCLC via PACNET) and federal libraries that participate in OCLC via FEDLINK should be included in all negotiated arrangements.
- o The State Library should conduct, or have conducted, a census survey of Arizona libraries to determine the exact status of any retrospective conversion efforts or ongoing cataloging to create machine-readable databases. Information should be collected about the format of machine-readable records, the source of machine-readable records, the extent to which the collection has been converted, the proportion of the collection that remains to be converted, the existence of special or unique collections, etc. The data collected from this survey should help make decisions about the sequencing of activities associated with building a statewide database.
- o The State Library should investigate the costs to load "foreign" records into the OCLC database, including the cost of any clean-up or processing needed before the records can be loaded into the group database. The State Library should then seek funds to load non-OCLC machine-readable records into the group database.
- o The State Library should develop guidelines for retrospective conversion of cataloging records into machine-readable form to minimize any problems associated with their being loaded into OCLC at a subsequent time.
- o The State Library should develop and implement an interlibrary loan compensation plan. The objective of this plan is to reimburse providing libraries (1) for request processing and referral through OCLC or other system and (2) or providing loaned items. Thus (1) intermediate centers and AILLC would be reimbursed for all request processing and referral from libraries operating under the "critical mass" and (2) intermediate centers, AILLC (PPL) and all other net lenders would be reimbursed for their amount of lending by public libraries and net lending by other types of libraries. Reimbursement would be based on a negotiated unit (i.e., per transaction) cost or one based on a state-wide accepted formula. Distributions of other State funds on a per capital or other formula might reflect amount of distribution done in the manner above.

SECTION 1

BACKGROUND

1.1 INTRODUCTION

Libraries as well as most other institutions in society have experienced severe budgetary and economic constraints in recent years. However, libraries have coped with economic constraints better than most institutions through their ingenuity, resourcefulness and generosity in sharing their resources. Libraries in Arizona have participated in such resource sharing through interlibrary loan, reference referral and other mechanisms. This resource sharing has involved libraries sharing among themselves as well as through county and district libraries and two centers: Arizona Interlibrary Loan Center (AILLC) which serves all types of libraries in and out of Arizona, and the State Reference Center (previously Arizona Research and Information Center [ARIC]) which serves public libraries.

The Arizona library community has recently developed and endorsed a long-range plan for Arizona libraries. Goal 1 of that plan states:

A statewide network of public, school, academic and special libraries will support the needs of Arizona residents for quality library service.

This was considered an appropriate time to examine the current resource sharing practices and to establish alternatives, taking into consideration advances in technology, trends in growth, experiences in other states and economic factors. In order to achieve this goal, a Resource Sharing Task Force was appointed to determine the best way to proceed. The Task Force, consisting of representatives from all types and sizes of libraries in Arizona, recommended that a project be funded and a consultant be hired to assist the Arizona Department of Library, Archives and Public Records, the Resource Sharing Task Force and the library community to accomplish Goal 1 of the long-range plan.

King Research, Inc., was chosen through competitive bid to perform the work. The objective of the project is to:

...provide specific, clearly defined options for sharing information and bibliographic resources.

The intent of the project is to "narrow the options to a few reasonable possibilities" and to "focus on positive options, not to cause confusion in the library community by failing to narrow the choices". Thus, the principal thrust of the project is to provide a small set of options that have been chosen for their feasibility, achievability, projected costs, and how well they address statewide library needs. The Scope of Work for the project can be found in Appendix A.

Options are discussed in Section 4 of this report. In order to provide a meaningful context for proposed options, we describe the current environment and procedures used for resource sharing through interlibrary loans and reference referral. This description, given in Section 2, includes the amount of resource sharing currently taking place by type of library, types of materials involved, structures employed and mechanisms used. We also provide an economic analysis of resource sharing. Estimates of the costs of the current system are based on analysis of the two statewide Centers (AILLC and SRC) and by projecting unit costs (largely established elsewhere) to the current amount of activity in Arizona. The economic analysis is described in Section 3.

1.2 THE LONG-RANGE PLAN FOR ARIZONA LIBRARIES

Since the project is a direct response to the Long-Range Plan for Arizona Libraries, we believe that it is appropriate to present portions of the Plan here to establish the context within which the project was performed. The mission statement and nine basic goals are as follows:

MISSION STATEMENT

All Arizona residents are entitled to secure information and materials in a form that can be used and understood. Arizona libraries fulfill their purpose to the extent that they meet the informational, educational, and recreational needs of their clientele.

SUPPORTING GOALS

Nine goals have been developed to support this mission:

- Goal 1:** A statewide network of public, school, academic, and special libraries will support the needs of Arizona residents for quality library service, information, and materials.
- Goal 2:** Libraries will receive assistance in improving services to their clientele.
- Goal 3:** Public libraries will operate under appropriate legislation and be supported adequately.
- Goal 4:** Libraries will have or be able to obtain reference and circulating materials to meet the needs of their clientele.
- Goal 5:** Residents of Arizona will be served by professionally trained, knowledgeable, and competitively paid staff.
- Goal 6:** Arizona public libraries will have knowledgeable and concerned trustees and friends groups.
- Goal 7:** Public library service will be provided to all residents of Arizona regardless of geographic location or economic conditions.
- Goal 8:** Arizona libraries will provide service to meet the needs of special populations.
- Goal 9:** Long-range plans for public libraries and the Department of Library, Archives, and Public Records will be developed, used as a basis for ongoing decision-making, and evaluated on an annual basis.

An elaboration of Goal 1, the basis of the project is repeated as follows:

- Goal 1:** A statewide network of public, school, academic, and special libraries will support the needs of Arizona residents for quality library service, information and materials.

Objective 1.1 By June 1988, an action plan for a statewide resource sharing network among all types of libraries will be developed and implementation begun.

The resource sharing plan should be developed by a representative statewide committee and reflect a consensus of the library community on resource sharing.

Components of the resource sharing plan should include:

- o The network will be directed toward multitype library cooperative resource sharing programs with primary emphasis on public libraries.
- o Primary network programs will be inter-library loan (ILL) and backup reference.
- o The network will be supported by a database(s) of titles and holdings maximizing use of libraries' existing OCLC records as a beginning database.
- o The network will be structured so that local libraries can access the resource sharing network.
- o County libraries, as appropriate, will serve as intermediate level ILL processors.
- o Major library(ies) will serve as resources of ILL and backup reference.
- o Appropriate information/document delivery systems will be identified.
- o A mechanism for reimbursement to net lenders will be developed.
- o Protocols for requesting information and materials will be established.
- o Responsibility for ongoing fiscal support at various levels will be identified.

Responsibility for implementing this objective includes:

- o Local libraries must be willing to participate fully in the statewide network by:
 - entering their holdings into the statewide database(s),
 - participating in ongoing maintenance of the statewide database,
 - lending materials upon request,
 - encourage patrons to use ILL and back-up reference, and
 - encouraging legislators to provide state support.

- o County libraries, where appropriate, should be intermediate centers between local libraries (either only public or all types of libraries) and resources. County libraries should develop a collection to serve as a resource center for the county. Counties should receive and process ILLs, selecting the closest source to fill requests. County libraries should assist local libraries in entering current holdings in the OCLC database. County libraries should pay part of the cost of maintaining the statewide database. County libraries should work with legislators in increasing state support.
- o Major public and academic libraries are likely to be prime sources of ILL materials, although this may decrease as holdings are entered into the database and other libraries' holdings are made accessible. Major public and academic libraries should commit collection resources to ILL.
- o State Library should assume a leadership role in designing and implementing the statewide network. It should:
 - appoint a committee to design the resource sharing system and provide staff support,
 - commit LSCA Title III funds to planning and implementing the statewide resource sharing network,
 - articulate need for legislation for ongoing state funding for the statewide resource sharing network through budget requests, justification, and other appropriate means, and
 - provide ongoing leadership and direction in implementing the network.

Organizations such as the Arizona State Library Association (ASLA) and AEMA should work with State Library to design and implement the network, encourage the legislature to provide funds for the network, influence public opinion, and provide professional leadership and direction as necessary.

Objective 1.2: By 1989, the State of Arizona will pay the cost of the resource sharing network. Components for funding include:

- o over, maybe 1 or 2 years
- o the state ILL center
- o the state reference center

- o county library access to holdings of a statewide database(s)
- o net lending reimbursement

It is appropriate to expect the State of Arizona to assume a major part of the funding of the statewide resource sharing network because it is designed to benefit all of the citizens of Arizona. Libraries, however, should also contribute to its support at all levels. A proportionate funding pattern should be prepared as part of the planning for the network.

Objective 1.3: By 1990, local Boards of Education will permit school libraries to borrow and lend materials as full participants in a multitype library resource sharing network.

All types of libraries should participate in the statewide network. There are often policy prohibitions that prevent full participation by school library media centers. These policies should be reviewed and changed as appropriate.

Objective 1.4 By 1990, reciprocal borrowing privilege programs should be designed and implemented in 75% of the counties.

In implementing this objective:

- o Local libraries should loan materials to patrons from other libraries.
- o County libraries should encourage libraries in the county to participate and include reciprocal borrowing in their regular plan of service
- o State Library should provide leadership and direction in establishing reciprocal borrowing programs. Once established, such reciprocal borrowing could be made a requirement for state funding.
- o ASLA should encourage participation in a statewide reciprocal borrowing program and provide leadership and direction as appropriate.

Objective 1.5: By 1989, a multitype, countywide, cooperative library group will be formed in each county.

Library cooperation within the counties should focus on collection development, technology, resource sharing, and the need to meet with library peers on a regular basis to stimulate and encourage cooperation on local issues. Activities for cooperative groups could include:

- o cooperating on summer library programs held in schools or public libraries;
- o keeping school libraries open in the summer;
- o sharing catalogs of holdings of local school and public libraries;
- o using technology where available;
- o unifying school/public library catalogs;
- o school libraries informing public libraries of major assignments requiring public library resources;
- o working to encourage reading among young people;
- o developing cooperative collection development policies;
- o sharing equipment, exhibits, and bibliographies;
- o cooperating on buying major reference books; and/or
- o developing cooperative collection development policies.

Implementation of this objective will be undertaken at the county level. In implementing this objective:

- o Libraries must be willing to commit time and resources to cooperative efforts.

- o County libraries usually are the appropriate agency to organize meetings, set the agenda, encourage ideas for additional cooperative efforts, and stimulate implementation of the ideas.
- o State Library should encourage library cooperation by collecting and disseminating information on cooperative projects. LSCA funding for special cooperative demonstration projects would also be appropriate.
- o ASLA should encourage participation in cooperative efforts at the county level and provide leadership and direction as appropriate.

1.3 METHODS EMPLOYED IN THE PROJECT

The principal methods employed in this project involved visits and interviews with the Arizona Interlibrary Loan Center (AILLC), the State Reference Center (previously ARIC), Department of Library, Archives and Public Records staff, and others; cost analysis of AILLC and SRC using rough cost finding methods; surveys of public, academic, school and special libraries; analysis of secondary information and data; and extensive additional communication with the Arizona library community through a presentation of project objectives and preliminary data findings at the annual Arizona Library Association meeting, special meetings with county district library directors, and Maricopa County Metropolitan Librarians discussions with members of the library community, and five meetings with the Resource Sharing Task Force.

Cost finding analyses were performed for AILLC and the SRC. The analyses were performed by identifying principal functions and tasks performed by these two centers, analyzing the budgets categorized by resources (i.e., staff, space, equipment, etc.) and allocating resource costs to the functions and tasks. For example, staff were interviewed and asked to indicate the proportion of time devoted to specific functions or tasks. These proportions were converted into estimated costs of specific functions or tasks by converting to their time and salaries or wages. Output quantities for AILLC were determined from existing records based on four sample week outputs provided by AILLC. SRC output was estimated by taking a sample of every 10th request form and data sheet from July 1989 through early March 1990. These forms provided such data as type of request, type of search performed,

other resources used, type of response, staff member(s), time spent and timeliness of response.

The survey methods are briefly described below. The survey was conducted to obtain information and data necessary to formulate relevant options for resource sharing. In particular, we obtained information and data concerning:

- o number of machine readable catalog records (MARC and non-MARC) and records on OCLC;
- o availability of local library automated systems, facsimile equipment, microcomputers/terminals and delivery services; and
- o data about ILL and reference requests such as type of requesting and filling library, extent of rush requests, author/title and subject requests, turnaround times, type of material requested, and request and response mechanisms used.

In order to obtain this information, survey questionnaires were designed and mailed to public, academic, school, institution and special libraries. The questionnaires were specially designed for each type of library and for large and small libraries. Census or sample sizes and response numbers for the surveys are given in Table 1.1.

TABLE 1.1
SURVEY DATA

Population Size, Outgoing Sample and Sample
Response by Type of Library: 1989

Type of Library	Population Size	Outgoing Sample	Sample Response	Response Rate (%)
1. Public (large)	15	15	13	87%
2. Public (small)	116	116	59	51
3. Academic (large)	3	3	3	100
4. Academic (small)	44	44	22	50
5. School	1,139	200	49	25
6. Special	113	63	22	35
Total	1,430	441	168	38%

SOURCE: King Research, Inc.

Public and academic library surveys were census surveys with response rates of 55 percent and 53 percent respectively. The listing of libraries surveyed was obtained from the Arizona Library Directory 1989. We were provided a listing of 1,129 mail labels of school libraries by Marilyn Ridgeway. We sampled 200 of these school libraries and one-fourth responded by the cut-off date in February. Special libraries included a list of institution libraries found in the Arizona Library Directory 1989 and special libraries found in the American Library Directory 1987-88. All together there are 113 special libraries in the sampling frame of which 63 were sampled and 22 responded. Copies of (1) the survey instruments and (2) description of data processing, analysis methods (i.e., weighting) and statistical reliability are given in Appendices B and C respectively.

SECTION 2

DESCRIPTION OF CURRENT INTERLIBRARY LOAN AND REFERENCE REFERRAL SERVICES IN THE STATE OF ARIZONA

2.1 INTRODUCTION

In this section we describe the current environment for interlibrary loan and reference referral in Arizona. We estimate that the extent of interlibrary borrowing in Arizona is currently about 113,900 items or 49,300 for public libraries, 37,900 for academic libraries, 15,600 for school libraries and 11,100 for special libraries. A major issue arises as to whether or not the amount of borrowing is what it ought to be. This question is difficult to answer because amount of borrowing depends so much on (1) the quality and comprehensiveness of individual collections in the State, (2) performance of lending libraries, (3) awareness of ILL, (4) ILL network capabilities, (5) extent of use of reciprocal borrowing, etc. However, general comparisons can be made on a per capita basis for borrowing by public libraries and school libraries. Our best estimate is that nationally there are about 0.04 public library loans per capita. Arizona public libraries borrow about a one-third that amount (0.014 items per capita). In some states, such as Wisconsin which have very mature interlibrary loan systems, the amount of interlibrary borrowing by public libraries is found to be about 0.088 items per person (or over six times the amount done by Arizona public libraries). As mentioned above, relatively low borrowing in Arizona might be attributed to a number of factors. For example, Maricopa and Pima counties are thought to have strong collections; in fact interlibrary borrowing in Pima county is almost non-existent. Furthermore, there is reciprocal borrowing in Maricopa County. The interlibrary borrowing by public libraries in these counties is 0.007 items per person which accounts for most of the low average by Arizona public libraries. The amount of borrowing by the rest of the State comes to 0.032 loans per person which is much nearer the national average (0.04) and close to such states as Pennsylvania which has excellent interlibrary lending systems.

Interlibrary borrowing by school libraries in Arizona is substantially less than the amount observed by King Research in other states. Even though we do not have national estimates,

we find that about 0.02 items per capita is typical. In Arizona this average is 0.004 items per capita or one-fifth of that observed elsewhere. Much of the low average is accounted for by the high adult to child ratio in Arizona, but we believe that more of the low average is attributable to lack of awareness and no formal interlibrary lending system for school libraries in Arizona. In fact, nearly one-fourth of the school librarians (media specialists) are unaware of interlibrary borrowing capabilities in the State. Only 39 percent of the school libraries currently participate in interlibrary borrowing activities. Of those who do not participate, 59 percent said they might if they knew more about it. The remainder (41%) said they definitely would if permitted by local board policy.

Amount of reference referral among Arizona libraries is estimated to be about 12,000 requests filled in the State. Most of the requests come from public libraries (69%), with the fewest coming from academic libraries (4%) since they have such strong in-house reference staff and reference collections. The remaining filled reference requests were provided about equally for school and special libraries. The State Reference Center provides about 38 percent of reference responses with public libraries handling 29 percent. Academic libraries provide about twice as many responses as requests and school and special libraries respond much less frequently (11% and 16%) than they request. We do not have good data for comparing amount of this activity with other states, although some states we have studied (e.g. Wisconsin) do substantially more reference referral relative to Arizona.

Section 2.2 provides a description of interlibrary loan activity in Arizona including type of materials borrowed, who receives initial requests and who actually provides loaned materials. We look at speed of response by whether the request was a "rush" request (i.e., needed within 2 or 3 days), source of request and material filling the request, and mechanisms used to transmit requests and responses. Section 2.3 provides a similar profile for reference referral activities. Section 2.4 discusses the current technology capabilities of Arizona libraries including automated systems currently in use and planned, and the extent to which catalog records are in machine-readable form (i.e., MARC, non-MARC and OCLC).

2.2 DESCRIPTION OF INTERLIBRARY LOAN (ILL) ACTIVITY IN ARIZONA

2.2.1 TOTAL INTERLIBRARY LENDING AND BORROWING

In this section we describe current interlibrary loan (ILL) activity in Arizona. We describe ILL requests and referral for four types of libraries (public, academic, school and special) and the Arizona Interlibrary Loan Center (AILLC). The amount of interlibrary borrowing and lending is summarized in Table 2.1 for the four types of libraries. The number of items borrowed by all four types of libraries is estimated to be 113,889 items. Of these 113,889 loans, 98,939 (87%) are estimated to come from in-state sources. The four types of libraries are estimated to lend 136,721 items of which 71,349 are loaned to Arizona libraries. Nearly 50,000 items are loaned by academic libraries to out-of-state libraries and about 16,000 items are loaned out-of-state by public libraries. In addition, though Phoenix Public Library AILLC loans an estimated 25,600 items to Arizona libraries and 8,800 items to other libraries. Arizona libraries are estimated to receive 2,900 items from other sources (i.e., non-library sources).

Public libraries in Arizona are slight "net lenders" to out-of-state libraries (15,957 vs. 12,774). Thus they gain about as much as they give. The relatively high level of lending by public Arizona libraries to out-of-state libraries is partially caused by the way the OCLC system lists library holding symbols alphabetically. Arizona libraries belonging to OCLC will appear early in the list and will tend to receive more requests than libraries appearing at the end of the list.

Amount of public library lending and borrowing in 1988 and 1989 is summarized by county in Table 2.2. Of the 57,833 items loaned by Arizona public libraries, about 24,528 are filled by Phoenix Public Library (42%) through referral from AILLC. The other Maricopa County libraries account for 20,363 items (35%) of the total, thus, about one-fourth of all loans from Arizona public libraries are from the remaining 14 counties. The pattern of borrowing by Arizona public libraries is somewhat different. Maricopa County accounts for 34 percent of all items borrowed and Cochise County involves another 21 percent. The most revealing picture is shown by examining net lending (Table 2.3). All of the counties, but Maricopa (with and

without the AILLC and Phoenix Public Library) and Pima Counties are net borrowers. That is, they borrow more than they lend. All together, excluding AILLC and Phoenix Public, the public libraries are net borrowers at a level of about 13,800 items. AILLC is estimated to provide about 15,000 items to in-state public libraries, thus they appear to account for most of the net borrowing. Comparing the estimated AILLC loans with the net borrowing (or lending) in Table 2.3 it appears that the comparison holds for nearly all counties except Cochise, Maricopa and Pima.

TABLE 2.1

INTERLIBRARY LENDING AND BORROWING

Number of Items Received (Borrowed) and Provided (Loaned)
by Type of Borrowing Library; by In-State and
Out-of-State: Arizona 1988-1989

Type of Library	Provided			Received		
	In- State	Out-of State	Total	In- State	Out-of State	Total
Public (1)	41,860	15,957	57,833	34,349	12,774	49,299
Academic (2,3,4)	20,023	49,399	69,422	37,917	(4)	37,917
School (2,4)	4,924	(4)	4,924	15,566	(4)	15,566
Special (2,4)	4,542	(4)	4,542	11,107	(4)	11,107
Total (5)	71,349	65,356	136,721	98,939	12,774	113,889

- SOURCE:
- (1) Arizona Public Library Statistics 1988-89
 - (2) King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)
 - (3) In-state and out-of-state data adjusted based on "What Does It Cost to Loan a Book from One Library to Another" Kenneth J. Bierman (1987 data).
 - (4) In the absence of data no out-of-state transactions were assumed.
 - (5) Totals do not sum because of the way they were reported (1).

TABLE 2.2

COUNTY SUMMARY OF PUBLIC LIBRARY INTERLIBRARY LENDING AND BORROWING

Number of Interlibrary Loans Actually Provided and Actually Received
by In-State and Out-of State and by County: Arizona 1988-89

County	Provided			Received		
	In-State	Out-of State	Total	In-State	Out-of State	Total
Apache (1)	32	0	32	995	104	1,099
Cochise (3)	3,747	175	3,922	9,476	940	10,416
Coconino (2)	266	4	281	2,231	588	4,493
Gila (4)	287	0	287	2,306	287	2,593
Graham (2)	8	0	8	544	62	616
Greenlee (2)	33	1	34	158	28	186
La Paz (1)	5	0	5	185	42	227
Maricopa (3,5)	31,299	13,587	44,891	8,754	7,710	17,003
Mohave (1)	181	0	181	716	212	928
Navaho (4)	497	0	497	1,928	405	2,333
Pima (1)	2,670	1,470	4,140	140	90	230
Pinal (2)	1,566	0	1,566	2,233	266	2,499
Santa Cruz (4)	0	0	0	850	37	850
Yavapai (2)	540	108	648	2,600	1,124	3,724
Yuma (1)	729	612	1,341	1,223	879	2,102
Total	41,860	15,957	57,833	34,349	12,774	49,299

SOURCE: Arizona Public Library Statistics 1988-89

- (1) County/Library District totals only
- (2) County/Library District and individual libraries
- (3) County/Library District and non-branch individual libraries
- (4) Individual libraries only
- (5) Includes AILLC from other special libraries and 13 percent from academic libraries. The pattern of lending libraries is fairly typical of other states, except that academic libraries in other states provide a higher proportion of materials to school and special libraries.

TABLE 2.3
COUNTY SUMMARY OF PUBLIC LIBRARY NET LENDING
Number of Net Loans by In-state and Out-of-state and by County
Arizona 1988-89

County	In-State	Out-of-State	Total	AILLC Est.(1)
Apache	(963)	(104)	(1,067)	888
Cochise	(5,729)	(765)	(6,494)	1,311
Coconino	(1,965)	(584)	(2,549)	3,018
Gila	(2,019)	(287)	(2,306)	1,461
Graham	(546)	(62)	(608)	499
Greenlee	(125)	(27)	(152)	259
La Paz	(180)	(42)	(222)	97
Maricopa (AILLC)	19,696	4,832	24,528	
Maricopa (w/o AILLC)	2,849	1,045	3,894	1,933
Mohave	(535)	(212)	(747)	628
Navaho	(1,431)	(405)	(1,836)	1,489
Pima	2,530	1,380	3,910	212
Pinal	(667)	(266)	(933)	1,625
Santa Cruz	(850)	(37)	(887)	294
Yavapai	(2,060)	(1,016)	(3,076)	2,083
Yuma	(494)	(267)	(761)	178
Total (w/AILLC)	7,511	3,183	10,694	--
Total (w/o AILLC)	(12,185)	(1,649)	(13,834)	15,975

SOURCE: Arizona Public Library Statistics 1988-89

(1) AILLC estimate based on 52.5% fill-rate.

(2) Parentheses means that libraries borrow more than they lend.

Table 2.4 provides estimates of the source of materials borrowed by all four types of libraries. Public libraries received their borrowed materials largely from public libraries and AILLC (48% and 30% respectively), although they also received an appreciable amount from academic libraries as well (20% of all items borrowed). Academic libraries received most of their borrowed materials from other academic libraries (81% of items borrowed). Public libraries and AILLC account for about two-thirds of the remaining sources. The pattern of borrowing by school libraries is that about two-thirds of the items come from public libraries and AILLC (47 and 21%) respectively and one-third from other school libraries. Special libraries rely mostly on public libraries and AILLC (37% and 26% respectively). Nearly one-fifth of the loans come from other special libraries and 13 percent from other sources. Academic libraries in other states provide a higher proportion of materials to school and special libraries.

The discussion above involves only sources from which borrowed items are said to be received. In fact, many of the requests are to the same library that actually fills the request (e.g., 70% of requests from small public libraries), but many requests are referred on the initial recipient of the request to another library. For example, borrowing public libraries submit about 16,347 requests to AILLC and AILLC receives approximately 14,060 additional public library requests that are passed on to them by referring libraries. The AILLC fills about one-half of these requests from the Phoenix Public Library collection and refers the remainder to other libraries through OCLC and some direct requests. About nine percent of requests to AILLC are cancelled. All together AILLC fills (through PPL) an estimated 52.5 percent of requests (not including those from PPL patrons) or referrals to them and most of the rest are filled or forwarded through OCLC (38%). See Section 3.4.1 for more data on AILLC services.

Table 2.5 gives the type of recipient to whom libraries submit their initial request. Comparing the initial requests to the final responders reveals that a large portion of the initial requests are filled by the initial recipient or a library of the same type. For example, public libraries submitted 24,292 initial requests to other public libraries (including county/district libraries) and the recipients of the requests fill the request or refer the requests to other public libraries a total of 23,780 times. (Note that another type of library or AILLC could also have referred a public library originated request back to a public library). We estimate that about

5,000 of the 49,299 public library requests are handled by county/district libraries (not including those handled for branch libraries).

TABLE 2.4
SOURCE OF BORROWED ILL
Number of ILL Requests That Are Filled
Type of Lending Library and Type of Borrowing
Library: Arizona Fall 1989

Type of Lending Library	Type of Borrowing Library				Total
	Public	Academic	School	Special	
Public	23,780	2,436	6,544	4,132	32,760
Academic	9,805	30,682	1,652	1,422	43,561
School	89	0	4,924	0	5,013
Special	709	1,385	0	2,066	4,160
AILLC (1)	14,578	2,270	2,446	2,065	21,359
Other (2)	338	1,144	0	1,422	2,904
Total	49,299	37,917	15,566	11,107	113,889

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)
 (1) Note that AILLC processes many more ILL requests, (See Section 3.4.1), but the requests may come from intermediary sources rather than directly from borrowing libraries and the filling libraries are not necessarily AILLC and/or Phoenix Public Library.
 (2) Includes libraries thought not to be included in those above by responding libraries.

TABLE 2.5

RECIPIENT OF INITIAL ILL REQUEST

Number of ILL Requests That Are Initialed by Type of Recipient Organization
and by Type of Borrowing Library: Arizona Fall 1989

Type of Recipient Library	Type of Library				Total
	Public	Academic	School	Special	
Public	24,292	2,228	7,370	4,132	38,022
Academic	8,080	28,145	0	1,422	37,647
School	33	0	4,924	0	4,957
Special	547	1,917	0	2,066	4,530
AILLC	16,347	4,298	3,272	2,843	26,760
Other (1)	0	1,329	0	644	1,973
Total	49,299	37,917	15,566	11,107	113,889

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)
(1) Includes libraries thought not to be included in those above by
by responding libraries.

We do not have precise data on fill rates, that is, proportion of times a library actually fills a request as opposed to referring it on or returning the request. However, rough estimates suggest that fill rates are about 47 percent for public, 67 percent for academic, 92 percent for school and 56 percent for special libraries. This means that referral is fairly substantial, particularly for public libraries. Note that we consider, for example, an item requested through OCLC on behalf of a requesting library as a referral.

2.2.2 ARIZONA INTERLIBRARY LOAN CENTER

The Arizona Interlibrary Loan Center (AILLC) should be viewed as providing several distinct services. The first service is one of processing initial requests for libraries that do not have OCLC or other automation capabilities. AILLC actually processes about 46,600 such requests per year at the present time. For these requests AILLC verifies the bibliographic citation and searches CLSI in the Phoenix Public Library (PPL) to see if they hold the requested item. If not, they search OCLC and locate potential lenders for the request. Thus, they also serve as a referral center. AILLC receives about 18,500 requests for interlibrary loans through OCLC which are also searched on the PPL CLSI and filled at PPL or referred on through OCLC. AILLC receives about 2,500 subject requests (included in the amounts above) that require special searching capabilities before requests can be filled with appropriate books or photocopies. About 5,400 requests come from PPL patrons. Finally, AILLC is a document delivery service through interlibrary lending from the Phoenix Public Library collection. The sources of request to AILLC are given in Table 2.6 below.

TABLE 2.6
SOURCE OF AILLC REQUESTS

Number of All Requests Processed by AILLC by Source of Request: Arizona 1989

Source	No. of Requests
Arizona public libraries	30,407
Arizona academic libraries	5,564
Arizona school libraries	2,496
Arizona special libraries	10,218
PPL patrons	5,386
Out-of-state libraries	9,685
Miscellaneous	6,747
Total	70,503

SOURCE: AILLC Sample Collections 1988/90

Most of the requests are for books, although some are for photocopies (i.e., periodicals) as shown in Table 2.7 below.

TABLE 2.7

TYPE OF REQUESTS TO AILLC

Numbers of ILL Requests Processed by AILLC by Type of Request: Arizona 1989

Type of Request	No. of Requests
Books	50,544
Photocopies	12,027
Subject (type of material not specified)	2,546
Referral only (PPL patrons) (1)	<u>5,386</u>
Total	70,503

SOURCE: AILLC Sample Collections 1988/89
(1) Reported by PPL

The disposition of these requests is estimated to be as shown in Table 2.8 below.

TABLE 2.8
DISPOSITION OF AILLC REQUESTS
Number of ILL Requests Processed
by AILLC by Their Disposition: Arizona 1988/90

Definition of Requests	No. of Requests
Filled at PPL	
Books	27,487
Photocopies	<u>6,719</u>
Total	34,206
Referred to other libraries	
OCLC	27,170
ALA (manual form)	<u>3,019</u>
Total	30,189
Request cancelled	<u>6,108</u>
Grand Total	70,503

SOURCE: AILLC Sample Collections 1988/90
Reported by PPL

Discussions of how we arrived at the estimates above and their implications for costs are given in Appendix D.

It is worth noting that the number of requests to AILLC has grown substantially in recent years as shown in Table 2.9.

TABLE 2.9

TRENDS IN REQUESTS TO AILLC

Number of ILL Requests to AILLC by Year: Arizona 1982 - 1989

Year	Requests Received	Increase (%)
1982-83	15,461	----
1983-84	21,626	40.0%
1984-85	26,142	20.9
1985-86	37,374	43.0
1986-87	46,648	24.8
1987-88	52,212	11.9
1988-89	65,117	24.7

SOURCE: AILLC Reports to State Library
 (1) Data do not include ILL requests by PPL patrons that are processed by AILLC.

Although, rate of growth has fluctuated substantially there is little doubt that growth is sustained and should continue, in the absence of external factors or influences taking place.

2.2.3 CHARACTERISTICS OF INTERLIBRARY LOANS IN ARIZONA

The type of material borrowed varies substantially by type of library (see Table 2.6). Books dominate interlibrary borrowing (70% of items borrowed) and are the most frequent type of material borrowed by all types of libraries. Even 69 percent of special library loan requests involve books. Usually special library borrowing elsewhere is dominated by journal articles. Otherwise, the patterns of types of materials borrowed are not unusual in Arizona. It is important to know the types of material borrowed because the material type affects the costs to both lending and borrowing libraries, penalties of lending (i.e., requests for photocopies of journal articles do not affect access to the material by patrons) and methods that can be used to transmit materials.

TABLE 2.10

TYPE OF MATERIAL BORROWED

Number of Items Borrowed by Type of Material
and Type of Library: Arizona Fall 1989

Type of Material	Type of Library				Total
	Public	Academic	School	Special	
Books	40,148	20,879	11,472	7,716	80,215
Journal articles	4,263	16,940	3,269	2,890	27,362
Audio-visual materials	753	88	825	135	1,801
Other materials	4,135	10	0	366	4,511
Total	49,299	37,917	15,566	11,107	113,889

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

Another factor that affects cost is whether the initial request is for a specific author or title: 97.7 percent of public library requests, all academic and special library requests and 89.4 percent of school library requests (observed from survey responses). Public libraries were asked whether they verified the bibliographic citation prior to submitting the request and whether they identified and located the holding library prior to submitting the request. Most of the public library requests (80.8%) had the bibliographic citation verified, but only 17 percent had the holding library identified and located. Of course, a large proportion of the requests were submitted with the idea that verification, identification and location would be done for them and that the requests would be referred on to the holding libraries. These two processes can affect the number of times requests are submitted until they are filled and the overall response times of interlibrary lending. The average number of times requests are submitted

in Arizona is 1.1 times per need which is below national averages. Response times are discussed below.

2.2.4 INTERLIBRARY LOAN RESPONSE TIMES AND TRANSMITTAL METHODS

The average response duration from the time a library sent the first request until the time the item was received is 7.6 days. This average is below what we have observed elsewhere. For example, in Wisconsin the average elapsed time was 11 days and in some states the average elapsed time has been as high as three weeks. There are several factors that normally affect total elapsed time such as whether the request is a rush request (i.e., needed within 2 or 3 days), method of transmitting both the request and the item filling the request, who fills the request and number of referrals required to fill the request. We do know from in-depth studies done elsewhere (e.g., Wisconsin) that elapsed time can affect user satisfaction and the extent to which interlibrary borrowing is used by libraries. About seven percent of requests in Arizona are estimated to be rush requests (see Table 2.11). This is significantly lower than we have observed nationally (28%). Both public and academic libraries request fewer than five percent rush request, whereas school and special libraries have about 20 percent of the requests being rush. We estimate that public library rush requests average 4.7 days and non-rush requests average 9.9 days to receipt of the requested items.

TABLE 2.11
RUSH REQUESTS

Proportion of Requests that Are Needed
Within 2 or 3 Days and Ave. Response Times by Type of Borrowing Library:
Arizona Fall 1989

Type of Borrowing Library	Proportion of Rush Requests (%)	Average Response Times (Days)		
		Rush	Non-rush	Total
Public	4.8%	4.67	9.93	7.9
Academic	2.7	--	--	7.0
School	21.0	--	--	7.0
Special	18.6	--	--	10.0
Total	7.1%	--	--	7.6

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

For public library requests, total time elapsed time does not seem to be affected by to whom the request is made or where the item came from. The range of average time does not vary among sources by over two days for either type of initial recipients or type of filling library. Response time is on the low side for AILLC as both initial recipient and filling (i.e., PPL) library. There is not a significant difference in total elapsed time (i.e., less than one-half day on the average) for the public libraries that verified and located holding libraries. However, if the request is referred on to another source, the process appears to take about 1/2 days longer; certainly not an appreciable delay.

Two factors do apparently make somewhat of a difference in elapsed response time. First, requests for journal articles take significantly less time than requests for books. However, most of these requests are rush requests. Second, method of transmittal and delivery appears to affect the response times. For example, methods of transmitting initial requests have the average elapsed times shown in Table 2.12.

TABLE 2.12

ILL TURNAROUND TIME

Average ILL Response Times by Type of Request
Transmittal: Arizona Fall 1989

Type of Transmittal	Elapsed Time (Days)
Telephone	3.4
Fax	5.2
Mail	7.4
Courier	9.0
OCLC	11.0

SOURCE: AILLC Sample Collections 1988/90
Reported by PPL

The results above concerning methods of transmission used, partially reflect rush requests. The methods used to submit initial requests are summarized in Table 2.13. The most prevalent methods are mail (particularly by all types of libraries except academic) and OCLC (particularly academic - 59% of requests and public - 34% of requests). Academic libraries are much more likely to use fax (21%), although about ten percent of public libraries also use this mechanism. Average response times are also related to means of transmitting loaned items. Mailed response (see Table 2.14) is the most prevalent means used for all types of borrowing libraries (78%). This is to be expected given the high proportion (70%) of book loans. The average

response time when this mechanism is used is about 8.5 days. When courier, fax (for article copies) or delivery van are used the average time is about 5.8 days.

TABLE 2.13
METHOD OF TRANSMITTING ILL REQUEST
Number and Projection of Requests that are
Transmitted by Various Means by Type of Borrowing Library
Arizona Fall 1989

Method of Transmitting Request	Type of Borrowing Library								Total	
	Public (%)	No.	Academic (%)	No.	School (%)	No.	Special (%)	No.		
Mail	41.0	20,200	13.5	5,125	47.3	7,363	57.0	6,331	34.3	39,019
Courier	7.7	3,795	0	0	0	0	0	0	0.3	3,795
Fax	10.6	5,201	21.0	7,962	0	0	0	0	11.6	13,163
Phone	4.8	2,382	0.2	63	47.4	7,378	18.6	2,066	10.4	11,889
Electronic Mail	0	0	3.0	1,144	0	0	0	0	1.0	1,144
OCLC	34.4	16,937	59.2	2,432	0	0	5.8	644	35.1	40,013
Delivery van	1.5	756	0	0	0	0	0	0	0.7	756
Other (1)	0.1	28	3.1	1,191	5.3	825	18.6	2,066	3.6	4,110
Total	100.1	49,229	100.0	37,917	100.0	15,566	100.0	11,107	100.01	113,889

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)
(1) Monthly personal visit

TABLE 2.14

METHOD OF RECEIVING BORROWED ITEM

Number and Proportion of Borrowed Items Received
by Method and by Type of Borrowing Library: Arizona Fall 1989

Method of Receiving Items	Type of Borrowing Library								Total	
	Public		Academic		School		Special			
	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.
Mail	88.0	43,364	78.9	29,923	52.7	8,203	64.0	7,108	77.8	62,598
Courier	5.7	2,824	10.0	3,796	5.3	825	6.7	744	7.2	8,189
Fax	1.8	903	4.5	1,703	0	0	0	0	2.3	2,606
Deliver Van	2.2	1,091	6.6	2,495	15.7	2,444	0	0	5.3	6,030
Other (1)	2.3	1,117	0	0	26.3	4,094	29.3	3,255	7.4	8,466
Total	100.0	49,299	100.0	37,917	100.0	15,566	100.0	11,107	100.0	113,889

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)
(1) Mostly personal pick-up

2.3 DESCRIPTION OF REFERENCE REFERRAL ACTIVITY IN ARIZONA

2.3.1 TOTAL REFERENCE REFERRAL

About 12,000 reference requests were estimated to be filled for Arizona libraries in 1989 (see Table 2.15). Public libraries initiate by far the most requests (8,205) with 1,345 requests from school libraries, 1,178 from special libraries and 455 from academic libraries (none reported from AU, ASU or NAU). The State Reference Center (SRC) is estimated to have sent about 785 requests to Arizona libraries, obviously as referrals in response to queries. The State Reference Center is the primary source of responses (4,588 based on the survey - see

Section 2.3.2 below), with public libraries being the second most common source (3,528 responses). Academic libraries are estimated to provide 968 answers to reference questions, special libraries 185 and school libraries 151 responses. Table 2.16 provides a breakdown of reported statistics for public libraries by 15 counties. The four most active counties are Yuma (2,618 requests), Cochise (1,893), Maricopa (1,046) and Pinal (845). These counties account for nearly four-fifths of all requests. No reference requests were reported by Mohave and Pima counties. In all instances the number of reference requests referred exceed number of requests filled in the county.

TABLE 2.15

REFERENCE REFERRAL

Number of Reference Referrals Answered
and Sent (Requested) by Type of Requesting Library:
Arizona: 1988-89

Type of Library	Answered	Sent (Requested)
Public (1)	3,528	8,205
Academic (2)	968	455
School (2)	151	1,345
Special (2)	185	1,178
State Ref. Center (2)	4,588	785
Total	9,420 (3)	11,967

SOURCE: (1) Arizona Public Library Statistics 1988-89
(2) King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)
(3) Other sources answered an estimated 2,373 reference requests

TABLE 2.16

COUNTY SUMMARY OF PUBLIC LIBRARY REFERENCE REFERRALS

Number of Reference Referrals Answered for Other Libraries and
Sent to Other Libraries by County: Arizona 1988-89

County	Reference Answered	Referrals Sent
Apache (1)	24	689
Cochise (3)	983	1,893
Coconino (2)	34	206
Gila (4)	70	156
Graham (2)	12	79
Greenlee (1)	44	127
La Paz (1)	25	30
Maricopa (4)	27	393
Mohave	---	---
Pima	---	---
Pinal (2)	569	845
Santa Cruz (4)	5	80
Yavapai (4)	13	43
Yuma (1)	1,341	2,618
Total	3,528	8,205

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

(1) County/District Library totals only

(2) County/District Library and individual libraries

(3) County/District Library and non-branch individual libraries

(4) Individual libraries only

As shown in Table 2.17, a large portion of the responses for public library requests not filled by public libraries are filled by the State Reference Center. Some of these requests are satisfied by academic libraries and other sources. The academic libraries also provide a number of reference responses to all types of libraries. They provide about twice as many answer as they initiate questions (933 vs. 455). School libraries ask many more questions than they provide responses (1,345 vs. 151). Over one-half (55%) of school library reference requests are satisfied by public libraries and about one-fourth by academic libraries. A similar pattern is followed by special libraries. The survey showed relatively little activity by the State Reference Center for any type of libraries except public libraries. Perhaps, awareness of their services might be a problem for all but public libraries, SRC might not be as equipped to serve other types of libraries, or the need simply might not be there. We have no evidence one way or the other.

The types of recipients of initial reference requests are generally the same as the responders, suggesting that referral might not be extensive (see Table 2.18). The public library survey revealed that 84.6 percent of the reference responses come from the same source to which the request was initially sent. The little referral that we can detect from the survey seems to come from special libraries referring requests to public libraries and the State Reference Center referring some requests to public libraries.

TABLE 2.17

SOURCE OF FILLED REFERENCE REQUESTS

Number of Reference Requests That Are Filled by
Type of Responding Library and by Type of Requesting
Library: Arizona Fall 1989

Type of Responding Library	Type of Requesting Library				Total
	Public	Academic	School	Special	
Public	2,624	311	743	538	4,216
Academic	269	144	300	270	983
School	0	0	151	0	151
Special	0	0	0	185	185
State Ref. Center	4,810	0	151	185	5,146
Other	502	0	0	0	502
Total	8,205	455	1,345	1,178	11,183

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

TABLE 2.18

RECIPIENT OF INITIAL REFERENCE REQUESTS

Number of Reference Requests That Are Initialed by
Type of Recipient Library and by Type of Requesting
Library: Arizona Fall 1989

Type of Recipient Library	Type of Requesting Library				Total
	Public	Academic	School	Special	
Public	1,844	311	892	340	3,387
Academic	0	144	151	171	466
School	2	0	151	0	153
Special	0	0	0	589	589
State Ref. Center	5,883	0	151	78	6,112
Other	476	0	0	0	476
Total	8,205	455	1,345	1,178	11,183

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

2.3.2 ARIZONA STATE REFERENCE CENTER

The State Reference Center (SRC) recently (July 1989) moved from the Tucson Public Library (Arizona Research and Information Center) to the Department of Library, Archives and Public Records. The survey of libraries done in 1989 identified an estimated 4,588 requests to the SRC, but the SRC, has not been operating at that level. The pattern of growth is shown in Table 2.19.

TABLE 2.19

TRENDS IN REFERENCE REQUESTS TO ARIC/SRC:

Number of Reference Requests
Processed By ARIC and SRC: Arizona 1983 - 1990

Year	No. of Requests	Increase (%)
1983-84	1,793	—
1984-85	1,734	-3.3%
1985-86	2,761	59.2
1986-87	3,171	14.8
1987-88	3,161	-0.3
1988-89	Unk	—
1989-90 (projected)	1,835	—

SOURCE: Data reported by ARIC to State Library
1989 - 90 King Research, Inc.

We do not know why requests have dropped since the transfer, except the process in itself may account in part for the decrease. That is, requestors may not be aware of the change or be accustomed to it yet. There is no indication (on a month-to-month basis) that number of requests are increasing, in fact, they may be decreasing slightly. The costs of the SRC services are given in Section 3.4.2.

2.3.3 CHARACTERISTICS OF REFERENCE REQUESTS IN ARIZONA

We asked libraries to indicate the type of reference request they make. The types of requests range in difficulty from bibliographic citations to in-depth answers to inquiries (e.g., what are tax laws concerning separation/divorce?). Interestingly, and probably properly, the number of requests increase as the difficulty of questions increases (see Table 2.20). This

pattern particularly holds true for public library requests and to a lesser degree with special libraries. Bibliographic citations account for seven percent of the requests. There were an

TABLE 2.20

TYPE OF REFERENCE REQUESTS

Number of Reference Requests of Various Types by
Type of Reference and by Type of Requesting Library: Arizona Fall 1989

Type of Reference	Type of Requesting Library				Total
	Public	Academic	School	Special	
Bibliographic citation(s)	188	96	151	340	775
Answer to brief question	682	167	744	171	1,764
Answer to a detailed question	2,726	48	299	78	3,151
In-depth answer to an inquiry	4,285	48	0	589	4,922
Other	324	96	151	0	571
Total	8,205	455	1,345	1,178	11,183

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

estimated 1,764 requests for answers to brief questions (e.g., year of Arizona statehood?), 3,151 requests for answers to detailed questions (e.g., how do you fix a leaking faucet or how do you treat poison ivy?) and 4,922 requests for in-depth answers to inquiries (described above). Public libraries account for about 85 percent of the two most difficult kinds of questions, but only 39 percent of answers to brief questions and about one-fourth of requests for bibliographic citations.

Special analysis of the State Reference Center services involved two components: inspection of a random sample of request forms and cost finding for specific functions performed by SRC staff. We took a sample of every 10th request and inspected the request form regarding type of request, staff member(s) involved, time spent by the staff member(s), duration of response time, and other relevant information. We examined 129 such request forms and, thus, assumed the total number of requests from July 1, 1989 to early March 1990 to be about 1,300 requests. The results are summarized below.

The types of requests received include:

o	Answers to brief questions and simple subject requests	38.0%
o	Detailed questions	51.9%
o	In-depth questions (often requiring online searches)	10.1%

There are various ways that responses to reference requests are provided (see Table 2.21). The most frequent type of response is specific answers to questions (55%). However, other types of responses are about equally used: documents (1,987), bibliographic citations (1,587) and other (1,234). The pattern is roughly the same for responses to all types of requesting libraries.

TABLE 2.21

TYPE OF REFERENCE RESPONSE

Number of Reference Responses by Types of Response and
by Type of Requesting Library: Arizona Fall 1989

Type of Response	Type of Requesting Library				Total
	Public	Academic	School	Special	
Never received	133	0	0	79	212
Bibliographic citations	1,309	48	151	79	1,587
Specific answers to questions	4,141	359	894	769	6,163
Documents	1,687	0	300	0	1,987
Other	935	48	0	251	1,234
Total	8,205	455	1,345	1,178	11,183

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

2.3.4 REFERENCE REQUEST RESPONSE TIMES AND TRANSMITTAL METHODS

Average response time for reference requests is slightly higher than for interlibrary loan requests (9.3 vs. 7.6 days). This is true even though there are more rush requests for reference queries than ILL requests (30% vs 7%). The response times vary by degree of difficulty of the questions. For example, response times are 4.3 days for bibliographic citations, 6.1 days for brief questions, 7.9 days for detailed questions and 12.7 days for in-depth questions. The largest total elapsed times are when requests got to the State Reference Center (10.6 days on average), but the Center also tends to answer the most difficult questions. The average times for initial request range from 3 days (academic libraries) to 5.3 days. Rush requests average 3.4 days in response. The average turnaround time at the SRC is estimated to be 6.6 days which varies by type of request as follows:

- o Answers to brief questions and simple subjects requests 5.2 days
- o Detailed questions 7.3 days
- o In-depth questions 7.8 days

When other sources were used the response times increased an average of about three days (9.6 days using PPL, 12.0 days using ASU, and 10.2 days using other resources). It appears that if a document is sent in response to the question, the time is likely to be great (19.5 days). Transmittal mechanisms also obviously have a bearing on response times as shown in Table 2.22.

TABLE 2.22

REFERENCE RESPONSE TIMES

Average Number of Days for Responses by Type of Transmittal and by Whether Method Was for Request or for Referral: Arizona Fall 1989

Type of Transmittal	Request	Response
Mail	12.2 days	10.4 days
Courier	7.0	7.0
Fax	6.1	.3
Telephone	5.8	1.2

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

Please note that the times in Table 2.22 are total elapsed time, not time the specific mechanism takes. If the requests are referred on, it appears to take an average of 3.5 more days.

Methods used to transmit requests and responses are given in Tables 2.23 and 2.24 respectively. Mail, fax and telephone are all used about equally for transmitting requests. However, special libraries are more likely to use fax and school libraries and academic libraries are more likely to use telephone. Responses to reference requests by public libraries are much more likely to be by mail than other methods. Telephone responses are more frequently used to respond to requests from the other three types of libraries.

TABLE 2.23

METHOD USED TO TRANSMIT REFERENCE REQUESTS

Number of Reference Requests by Type of Transmittal
Method and by Type of Requesting Library: Arizona Fall 1989

Type of Transmittal Method	Type of Requesting Library				Total
	Public	Academic	School	Special	
Mail	3,413	0	151	79	3,643
Courier	521	0	0	0	521
Fax	2,347	127	0	1,099	3,573
Telephone	1,924	328	1,043	0	3,295
Other	0	0	151	0	151
Total	8,205	455	1,345	1,178	11,183

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

TABLE 2.24

METHODS USED TO TRANSMIT REFERENCE RESPONSE

Number of Reference Responses by Type of Transmittal
Method and by Type of Requesting Library: Arizona Fall 1989

Type of Transmittal Method	Type of Requesting Library				Total
	Public	Academic	School	Special	
Mail	5,554	48	503	273	6,378
Courier	848	0	0	0	848
Fax	1,149	96	0	85	1,330
Telephone	464	311	842	735	2,352
Other	190	0	0	85	275
Total	8,205	455	1,345	1,178	11,183

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

2.4 TECHNOLOGY CAPABILITIES OF ARIZONA LIBRARIES

Public libraries recently reported their technology capabilities to the State. These results are summarized in Table 2.25. About one-fifth of the public libraries in the State have automated circulation systems and an equal number (but not the same ones) have CD ROM on laser equipment. Less often public libraries have automated systems for cataloging, acquisitions, serials, etc. (14 libraries); public access catalogs (10 libraries); and on-line

TABLE 2.25

COUNTY SUMMARY OF PUBLIC LIBRARY TECHNOLOGY CAPABILITIES

Number of Public Libraries That Have Public Access Catalog; Automated System
For Cataloging, Acquisitions, Serials; Use CD ROM or Laser Disk;
Does Online Database Searches and Number of Searches; Have
Automated Circulation System by; County: Arizona 1988-89

County	PAC	Catalog etc.	CD-ROM/ Laser	Online Search		Auto. Circ.	
				Libr.	Searches	Libr.	System
Apache	1	0	0	0	0	0	
Cochise	0	0	0	0	0	2(4)	(5),(9)
Coconino	0	1(1)	5(2)	2(2)	435	1	(7)
Gila	0	0	3(2)	0	0	0	
Graham	0	1(1)	0	0	0	1(1)	(8)
Greenlee	0	0	0	0	0	0	
La Paz	0	0	0	0	0	0	
Maricopa	5(4)	7(4)	6(4)	5(4)	5,755	13(2)	(5)-3,(6)-2,(7),(8) (10),(11),(12),(13) (15)
Mohave	0	0	1(1)	0	0	0	
Navajo	0	0	0	0	0	0	
Pima	0	1(1)	1(1)	1(1)	8,710	1	(6)
Pinal	1(4)	1(4)	4(2)	0	0	2	(5),(7)
Santa Cruz	0	0	0	0	0	0	
Yavapai	1(4)	2(2)	3(2)	0	0	2(2)	(6)-2
Yuma	1(1)	1(1)	0	0	0	1	(14)
Total	10	14	23	8	14,900	23	

SOURCE: Arizona Public Library Statistics 1988-1989

(1) County/District Library totals only, (2) County/District and individual libraries
(4) Individual libraries only, (5) Circulations Plus, (6) CLSI, (7) Gaylord,
(8) Follett, (9) Classic, (10) Index, (11) DOBIS, (12) ATLAS, (13) SIRSI,
(14) SCAMP, (15) IBM

searches (8 libraries). We asked libraries on the library survey to also indicate their current and planned technology capabilities. These capabilities are summarized as follows:

TABLE 2.26

CURRENT USE AND PLANS FOR TECHNOLOGY

Proportion of Libraries That Use or Plan Various Technologies
by Type of Technology and by Type of Library: Arizona Fall 1989

Type of Technology	Type of Library			
	Public	Academic	School	Special
OCLC				
Currently have	17.4%	70.2%	7.2%	18.6%
Planned in 5 yrs.	12.4	0	10.7	12.8
No plans	70.2	29.8	82.1	68.6
Other systems				
Currently have	38.3%	92.2%	57.5%	54.3%
Planned in 5 yrs.	30.8	7.8	32.52	2.9
No plans	30.9	0	10.0	22.9
Fax				
Currently have	49.7%	100.0%	3.3%	52.7%
Planned in 5 yrs.	20.9	0	23.3	12.1
No plans	29.4	0	63.4	35.2
Micros/terminals				
Currently have	55.4%	93.5%	66.7%	70.3%
Planned in 5 yrs.	20.3	6.5	23.8	17.6
No plans	24.3	0	9.5	12.1

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

The extent of technology capabilities existing or planned is fairly extensive compared with other states and in considering the number of small libraries in the state. This, as shown in the next section, is important in considering various automation options.

Another consideration is the extent to which catalog of holdings are found in machine-readable form; particularly in MARC format. Survey estimates are as follows:

TABLE 2.27

HOLDINGS IN MARC FORMAT

Proportions of Libraries That Have Holdings in MARC
Format, Number of Records and Proportion of Records in MARC
Format by Type of Library: Arizona Fall 1989

Format	Type of Library			
	Public	Academic	School	Special
Records in MARC				
Prop. of libraries(%)	26%	34%	14%	
No. of records	2.2 mil	5.6 mil		.07 mil
Prop. of total(%)	65%	Unk.	Unk.	Unk.
In non-MARC				
Prop. of libraries(%)	17%	15%		20%
No. of records	0.6 mil	0.2 mil		0.1mil
Prop. of total(%)	18%	Unk.	Unk.	Unk.
In OCLC				
Prop. of libraries(%)	17%	70%	7%	19%
No. of records	1.6 mil	2.7 mil		0.5 mil
Prop. of total(%)	47%	Unk.	Unk.	Unk.

SOURCE: King Research, Inc. Survey of Arizona Libraries (N = 1,399; n = 168)

Amount of retrospective conversion might not be too high based on extent of current records found in machine-readable form.

SECTION 3

ECONOMIC ANALYSIS OF INTERLIBRARY LOAN AND REFERENCE REFERRAL

3.1 INTRODUCTION

Below we discuss some economic considerations of interlibrary loan and reference referral. The first consideration of resource sharing involves cost. Most economic studies focus on the cost to lending libraries and this cost is clearly important. However, we feel that it is important to also determine the cost to the borrowing library for two reasons. First, borrowing libraries should always consider their costs in deciding whether to purchase or borrow materials. The cost to borrow is usually higher than most borrowing libraries realize. There is a point in amount of use (i.e., number of times an item is borrowed) in which it becomes less expensive for the library to purchase the item. Second, any options that might be proposed as a result of this project will affect the cost to the borrowing libraries as well as to the lending libraries and central facilities. One should not analyze costs of ILL and reference referral services without also examining their value. Value of these services is discussed in Section 3.5. Another very important aspect of resource sharing options is economies of scale. We discuss this in some depth in Section 3.6. Related to economies of scale are the technologies used as well as basic structure and protocols for requesting.

3.2 ECONOMIC COST TO REQUESTING LIBRARIES AND PATRONS

It is useful for all participants in interlibrary loan and reference referral to know the costs to requesting libraries and their patrons. These costs are higher than most realize. The costs to requesting libraries include resources used to search and verify, process requests, receive and process received items and, for borrowing libraries, there are also costs associated with return of the borrowed items to the lending libraries. Sometimes providing libraries (particularly in other states) charge for their services and therefore, is a cost to the borrowing library. The

cost to patrons of requesting libraries is largely in the delay in receiving items or reference responses. Typically the costs we have observed in other states are as follows: ¹

- o Interlibrary borrowing
 - \$4.78 per item borrowed (to requesting library)
 - 7.6 days time delay (to patrons)
- o Reference referral
 - \$6.38 per reference request (to requesting library)
 - 9.3 days time delay (to patrons)

Even though the costs are not insignificant to libraries and their patrons, the costs of alternatives are even greater.

In-depth studies performed by King Research indicate that it would cost substantially more to use alternatives to interlibrary borrowing and reference referral. In fact these studies show the alternative cost would be about \$38.40 per item borrowed. This cost includes price and processing costs associated with purchasing or subscribing to the item, using a document delivery service, and so on. About one-third of the time borrowing libraries indicate they would have the patron visit another library. This is estimated to cost patrons about \$2.60 and 37 minutes of their time. The alternative cost for reference referral is estimated to be about \$110 per request. Here about 36 percent of the requests would not be satisfied by the requesting library. The cost to the patrons is \$3.50 per request and 43 minutes per request to go to alternative sources. Thus, even though the cost to borrowing libraries is not inconsequential, the cost of alternatives is substantially higher, probably by an order of magnitude.

On the other hand, there is a point in amount of use of borrowed materials at which it becomes less expensive to purchase rather than borrow books and periodicals. Typically, for example, it is less expensive to subscribe to an inexpensive periodical if there are more than say, five (to ten) readings of a year's subscription over the life of these issues. Thus, borrowing libraries should maintain records of amount of borrowing as a matter of course for

¹Costs to patrons come from the Arizona survey.

collection development purposes. This is just good management practice and it adheres to copyright laws as they relate to interlibrary borrowing.

3.3 ECONOMIC COST TO PROVIDING LIBRARIES

Again we do not have complete cost data for providing interlibrary loans and reference referral in Arizona. However, we do have some data from AILLC and the State Reference Center and we do have some data from a recent study of nine libraries in Arizona and substantial data from other King Research studies. From the other studies we estimate the average cost to lending libraries to be about \$5.40 for filled requests; \$2.90 for request processing, bibliographic verification, and location of sources; and \$1.70 for unfilled requests that are just referred elsewhere. A cost study of nine libraries was performed in Arizona in 1988 with estimated corresponding costs being about \$5.10 per filled request (including unfilled requests) or about \$3.10 - \$3.40 per filled request and \$1.70 to \$2.00 per unfilled request. We believe the difference in costs between our averages and the Arizona results is attributable to two factors: (1) our figures may include more activities and overhead and (2) our averages are from libraries of all sizes whereas the Arizona study involved libraries with relatively large numbers of transactions (see our discussion of the effects of economies of scale in Section 3.6 below). The activities included in our average costs are bibliographic verification, locating and retrieving items, copying (for periodicals), sending loaned items, processing overdues, receiving loaned items back, reshelving or storing the loaned items and other activities. There are other hidden costs to lending libraries as well, including having items on loan and, therefore, not available to their own patrons (in some states this has been as much as 22 days of unavailability or 5% of loaned items involved) and some items being soiled or damaged in some way (about 1% of loaned items in other states).

We have less data on the costs of reference referral. Our best estimate of processing this kind of request ranges from \$2.00 for brief look-up to \$16.00 for in-depth requests. Processing unfilled requests is more than for interlibrary loan because referral is generally more time consuming (i.e., about \$1.80 per request). The costs to requesting libraries are about \$6.10 for filled requests and \$3.20 for unfilled requests. These costs include submitting the

reference requests as well as receiving and processing the reference responses. Costs of individual transactions of both ILL and reference referral vary substantially among requests according to complexity of the request, sending and response methods, availability of automated systems support, and so on. However, a major factor affecting cost is the number of transactions involved, which is discussed in the section on economics of scale (Section 3.6)

3.4 THE COST OF AILLC AND THE STATE REFERENCE CENTER

We performed a special cost analysis of the two state-funded centers - Arizona Interlibrary Loan Center (AILLC) operated by Phoenix Public Library (PPL) and the State Reference Center (SRC) operated by the Arizona Department of Library, Archives, and Public Records (State Library). The cost analysis involved rough cost finding methods used to allocate resources to specific functions or activities. Details of these cost analyses are found in Appendices D and E respectively.

3.4.1 THE COST OF AILLC

AILLC was estimated to handle about 65,117 requests in 1989/90. In order to estimate the average cost per transaction accurately we added to that number 5,386 interlibrary loan requests that are initiated by PPL patrons. Thus, for analysis purposes, the AILLC processes an estimated 70,503 interlibrary loan requests. A brief description of the sources of these requests, channels of request, types of request and final disposition was given in Section 2. Some of these data used in the cost analysis come from quarterly AILLC samples provided to State Library for computer processing and tabulation and some come from our interpretation of these data and from discussions with AILLC staff.

The budget for AILLC is given at about \$340,000. This budget was subdivided in two ways by us: by type activity (processing initial requests, verification and location, referral, fulfillment and cancellation) and by cost components (i.e., labor, overhead, other direct costs and administration). These costs and numbers of transactions are summarized in Table 3.1 below. Some comparisons are made with other King Research data involving large operations. Average costs of processing initial requests and verifying/locating are about \$1.50 compared

with \$1.86 at AILLC. However, the number of subject requests and difficult verification at AILLC seems higher than observed elsewhere which accounts for much of the difference. The costs of filling requests elsewhere have ranged from \$1.35 to \$5.17 with about \$2.80 being typical in comparable libraries or centers. Request referral costs have ranged from \$2.20 to \$2.90.

TABLE 3.1
 AILLC ACTIVITY AND COST
 Number of Transactions, Total Cost and Average Cost
 by Type Activity for AILLC: 1988/89

Type of Activity	No. of Transactions	Total Costs (\$)	Avg. Costs (\$)
Process initial requests	70,503	\$12,030	\$0.17
Verify/locate			
Subject	2,546	23,870	9.38
Books/photocopy	56,182	48,000	0.85
Difficult verification	<u>6,389</u>	<u>37,980</u>	<u>5.94</u>
Total	65,117	109,850	1.69
Filled requests (PPL)			
Books - out	27,487	69,290	2.52
- in	(27,487)	32,060	1.17
Photocopy	<u>6,719</u>	<u>38,580</u>	<u>5.74</u>
Total	34,206	139,930	4.09
Refer requests	30,189	79,730	2.64
Cancel	6,108	620	0.10

SOURCE: AILLC 1989/90 Projected Cost
 AILLC Sample Collections 1988/90
 King Research, Inc.

3.4.2 THE COST OF SRC

A special cost finding analysis was performed for the State Reference Center by estimating types of reference requests from a sample of requests and by determining the average cost of these requests through cost finding methods. Estimated number of transactions, total costs and average costs are given in Table 3.2.

TABLE 3.2

SRC ACTIVITY AND COST

Number of Transactions, Total Cost and Average Cost
by Type of Search for SRC: July 1989 - March 1990

Type of Request	No. of Transactions	Total Costs (\$)	Avg. Costs (\$)
Brief	494	\$ 32,728	\$ 66.25
Detailed	675	48,708	72.16
In-depth	131	12,458	95.10
Total	1,300	\$ 93,894	\$ 72.23

SOURCE: King Research, Inc.

The average costs per search are considerably higher than costs observed by us elsewhere. Such equivalent overall costs are in the range of \$20 to \$30 per request. The high costs at SRC may be explained by the large other direct costs (\$43,898) which are spread across a relatively small number of requests (\$33.77 per request). Also, most other centers do not include responses in the form of books, photocopies and interlibrary loan referrals. If one adds the expected costs of these services to the average costs observed elsewhere, the average costs would be in the range of \$30 to \$40. If the Center would increase activity up to, say, 5,000 requests per year the average cost per request would decrease to about \$50 which is

somewhat closer to the expected average cost of \$30 to \$40 to provide reference searches and identified materials.

3.5 THE VALUE OF INTERLIBRARY LOAN AND REFERENCE REFERRAL

There are many benefits achieved through resource sharing among Arizona libraries. Certainly the fact that every Arizona citizen is provided access to the world's literature through such sharing is both remarkable and has appreciable value. Another way of assessing the value of resource sharing is by comparing the costs of services provided through resource sharing with costs of alternatives. Presently we estimate that it costs Arizona libraries about \$1.3 million to accomplish interlibrary lending (and borrowing) and an additional \$255,000 to use shared reference referral services. Thus, the total cost of these services is about \$1.6 million. We estimate from other studies that the costs of alternatives are likely to be substantially greater. These costs are summarized as follows:

- o Costs of alternatives to libraries
 - \$5.6 million (\$4.4 million ILL and \$1.2 million reference referral).
- o Costs of alternatives to patrons
 - \$335,000 (\$296,000 ILL and \$39,000 reference referral)
 - 78,000 hours in time (70,000 ILL and 8,000 reference referral)

Thus, a rough estimate of the value of interlibrary loan and reference referral is the difference in current costs and costs of alternatives. In Arizona this difference or value is \$4.0 million to libraries and \$335,000 and 78,000 hours to patrons.

It is our conjecture that State (and Federal) library funds can achieve substantially more benefit than by merely distributing all funds directly to libraries. There are three ways that additional leverage can be accomplished. The first way is by funding (or supporting) services (or activities) in which resource sharing among libraries takes place. This is exactly what is being done with funds directed toward activities such as interlibrary loan and reference referral. Evidence, as shown above, suggests that such consequences might be substantial indeed.

The second way involves services (or activities) in which economies of scale can be achieved. We show in Section 3.6 that even further savings can be obtained for interlibrary lending and reference referral by having large libraries and centers perform some functions for small libraries because of economies of scale. The third way that leverage can be achieved is the optimum use of technology. Various options concerning technology are discussed in Section 4.

3.6 ECONOMIES OF SCALE

Economies of scale mean that libraries can perform some work or provide some services less expensively when more work is done or when more transactions are provided. That is, the average cost per transaction goes down as the number of transactions increases. Thus, for interlibrary lending and reference referral it costs large libraries less on the average than small libraries to process requests. Economies of scale are achieved through several means:

- o large fixed costs are spread across larger amount of services provided,
- o large operations can usually perform some production-like activities less expensively than small operations,
- o batched activities can normally be done more productively than if they are done in a sporadic manner,
- o larger library operations by having staff with specialized competencies (i.e., knowledge and skills) can more productively utilize such expertise, and
- o some services, supplies, etc., can be purchased from vendors with volume discounts.

Two figures (Figures 3.1 and 3.2) are presented below to help explain the achievement of economies of scale through the spreading of large fixed costs.

The first figure shows total costs plotted against number of transactions and the second shows average cost plotted against number of transactions. Assume that the fixed cost of a service, say online bibliographic searching (from vendors such as Dialog, BRS, etc.), is \$3,000 even if there are no searches in a year (Figure 3.1). Assume that one search costs \$30. If

there is only one search in a year the total cost is \$3,030 (Figure 3.1) and the average cost is also \$3,030 (Figure 3.2). If there are two searches, the total cost increases to \$3,060 ($\$3,000 + 2 \times \$30$) and the average cost per search drops dramatically to \$1,530 ($\$3,060/2$). With three searches the total is \$3,090 and the average is \$1,030, and so on. As the number of searches increases, say to 100 searches, the total cost increases to \$6,000 ($\$3,000 + 100 \times \$30$) and the average cost decreases to \$60, a number much nearer to \$30, the incremental cost. At 1,000 searches the total cost is \$33,000 and the average cost is \$33. One can continue to increase the number of searches and the average cost will continue to come closer to \$30 but never quite reach it. Thus, the incremental variable cost is an asymptote. The amount of service (or number of transactions) at which the average cost comes close to the incremental cost is referred by us as the "critical mass." That is, the critical mass is the amount of service libraries should try to approach in order to achieve the greatest savings.

There are clearly economies of scale operating with interlibrary loan request processing. For example, the average costs for the data obtained in the 1988 Arizona ILL study clearly show economies of scale as shown in Table 3.3.

TABLE 3.3

AVERAGE COSTS OF ILL FOR LARGE LIBRARIES

Average Direct Cost for Filled and Unfilled Requests
by Number Requests Filled: 9 Arizona Libraries 1988

No. of ILL Requests Filled	Avg. Direct Cost of Each Unfilled Request	Avg. Direct Cost of Each Filled Request	Estimated Avg. Total Costs
19,500-27,000(3)	\$1.39	\$2.77	\$4.16
5,500-6,800 (2)	\$2.02	\$4.04	\$6.06
3,100-3,300 (2)	\$2.45	\$4.90	\$7.35
1,800-2,500 (2)	\$3.27	\$7.19	\$10.46

SOURCE: "What does it Cost to Loan A Book From One Library to Another?", Kenneth J. Bierman, Draft May 1988

(1) No. of libraries in parentheses.

(2) Calculations by King Research, Inc.

FIGURE 3.1

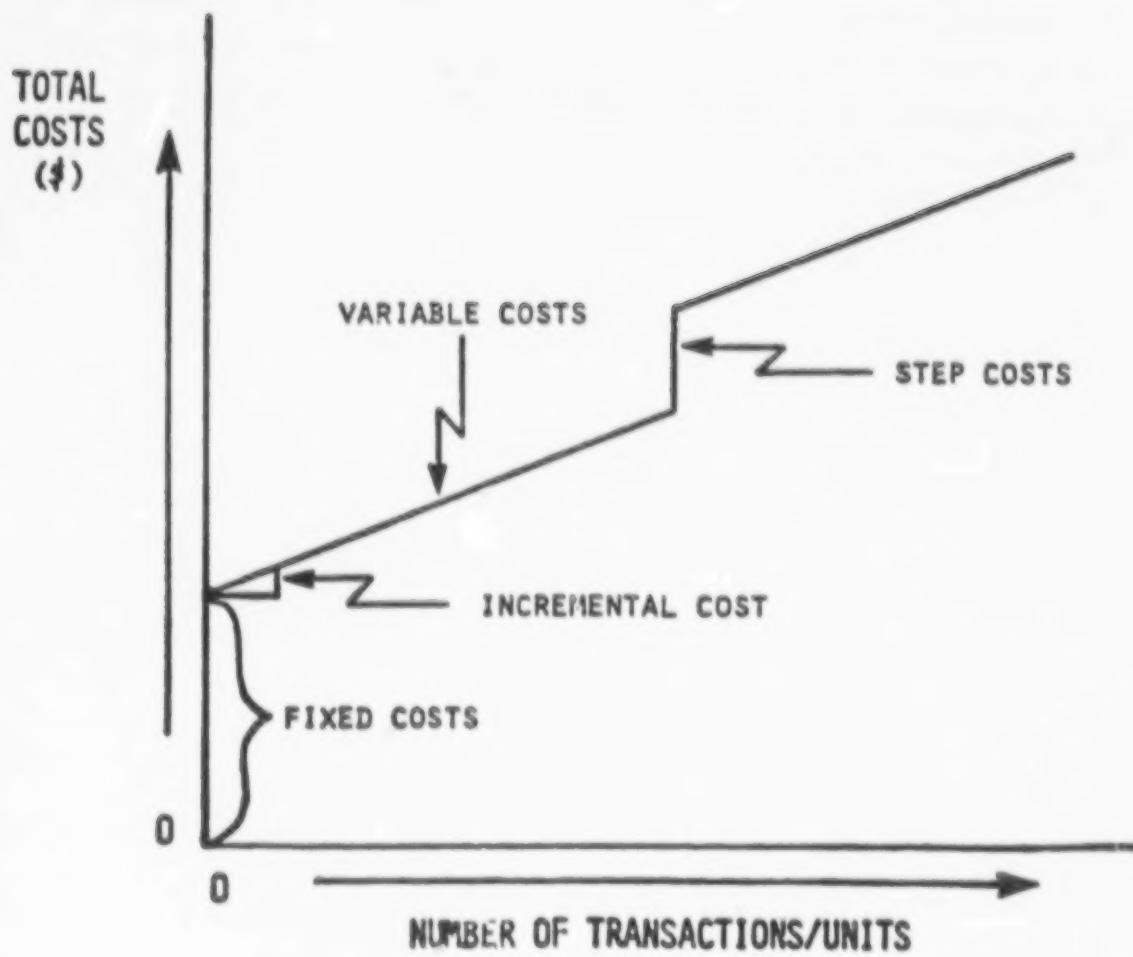
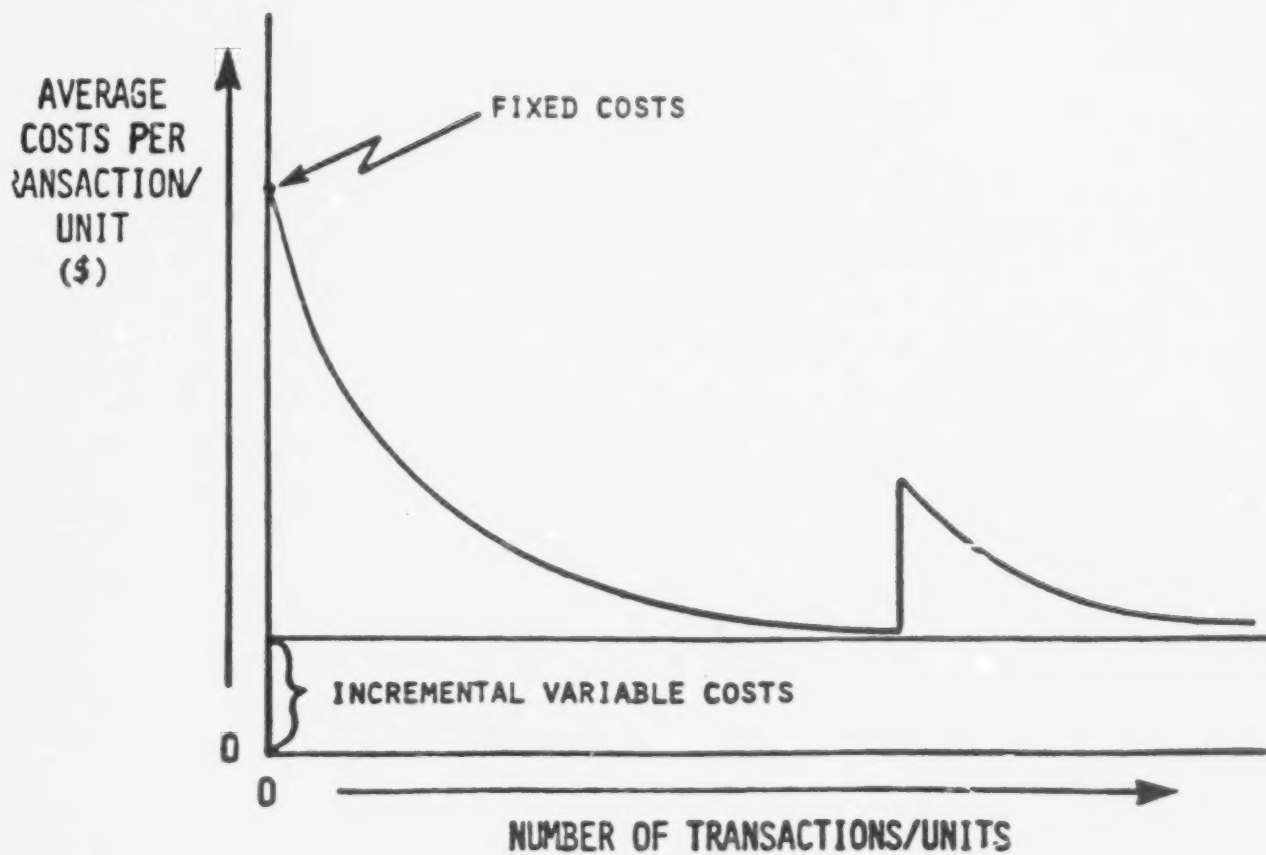


FIGURE 3.2



Costs of unfilled requests are estimated to be 50% of the cost of filled requests. Thus, average total costs are \$4.16 per request for the libraries that have a large number of requests and as the number of requests processed decreases the average cost increases to about \$10.46 per request when there are about 2,000 requests. Our data from other states show similar economies of scale as shown in Table 3.4.

TABLE 3.4
AVERAGE COST TO LEND AND TO BORROW
Average Cost to Lend by Various Functions and to
Borrow All by Number of Transactions

No. of Transactions	Cost to Lend			Cost to Borrow	
	Filled	Proc., Verify, & Locate	Proc. Only	Filled	Unfilled
Less than 1,000	\$13.50	\$9.50	\$4.10	\$8.50	\$4.90
1,000 - 2,500	8.50	5.60	2.60	6.00	3.10
2,500 - 5,000	5.70	3.00	1.90	3.70	1.20
5,000 - 10,000	4.40	2.30	1.40	2.80	1.00
over - 10,000	4.10	2.10	1.30	2.40	0.90

SOURCE: King Research, Inc. Compilation of data from studies in Pennsylvania, New York, Wisconsin and a national survey of libraries.

It seems clear that substantial economies of scale exist for interlibrary lending in Arizona as well as in other states.

We will show how to take advantage of this fact in Arizona later, but first it is worth noting that there are many other library services for which economies of scale exist as well including acquisition of library materials, most technical processes; automated circulation; reference, referral and research; and retrospective conversion. Some states, such as New

York, direct most of their funding to centralized services (called Library Systems) rather than providing direct aid to public libraries. By using this strategy for some services and operational functions, the public libraries receive an equivalent of about 3.5 times the amount of State-supported services than they might otherwise have if they were given the funds to support only in-house operations and services.

One way that Arizona can begin to take advantage of this powerful economic leverage is through funding support for resource sharing done by interlibrary loan and reference referral. A second way is through support of library automation at county/district levels. The problem, as we will show below, is that economies can be achieved very quickly through certain strategies for interlibrary loan and reference referral, but the other benefits will take longer because of the unique mixture of library services in Arizona. We suggest a long term strategy that melds the best of both needs over a five to ten year period in the Executive Summary. First, we show below how substantial savings can be achieved for interlibrary loan and reference referral as a first phase in this strategy.

Currently, most of the lending in Arizona (83%) is being done by large libraries (i.e., over 2,500 loans) and AILLC. In fact, of the 57,833 items loaned by public libraries, the amounts are as shown in Table 3.5.

TABLE 3.5

LENDING COSTS IN ARIZONA

Estimated Average Lending Cost, Total Number of Loans and
Total Cost All by Number of Transactions: Arizona 1988-1989

No. of Transactions	Est. Cost (\$)	Total No. of Loans	Est. Total Cost (\$)
Less than 1,000	\$13.50	5,389	\$72,750
1,000 - 2,500	8.50	4,486	38,730
2,500 - 5,000	5.70	14,944	85,180
5,000 - 10,000	4.40	8,486	37,340
Over 10,000	4.10	24,528	100,560
Total	\$5.80	57,833	\$333,960

SOURCE: (1) Estimated cost from King Research, Inc. compilation of data
(2) Total number of loans from Arizona Public Library Statistics 1988 - 1989
(3) Calculations by King Research, Inc.

The total estimated cost is \$333,960 and the average cost per item loaned is \$5.80.

If our estimates of average costs are correct, we find that libraries providing under 1,000 loans account for less than ten percent of the loans but for 22 percent of the costs.

The "critical mass" for lending is about 5,000 items loaned. That is, if we double the number of items loaned from 5,000 to over 10,000 items the average cost would decrease by only \$0.30 (or 7%). Ideally, one would like all lending to be above that amount. For example, if all lending in Arizona were done by libraries (local or county/district) or center(s) with over 5,000 items loaned, the total cost to the library community would be at most about \$254,470 (i.e., 57,833 loans x \$4.40 per loan). The current cost is estimated to be about \$333,960 so that there would be a savings of at least about \$79,490. Note that the current practice of having AILLC and larger libraries process loans probably already saves at least that amount.

For example, if only libraries with under 5,000 loans processed requests the cost to the Arizona library community would be about \$142,719 more than the current \$333,960.

Above we indicated that \$79,490 might be saved by having only large libraries loan materials. From the borrowing side, there is not a great deal that one can do except help small libraries with certain borrowing activities Table 3.6 below.

TABLE 3.6
BORROWING COSTS IN ARIZONA
Estimated Average Borrowing Costs and Total
Total Number of ILL Requests All by Number
of Transactions: Arizona 1988-1989

No. of Trans- actions	Est. Avg. Cost (\$)	Total No. of ILL Requests	Est. Total Cost (\$)	Verif. & Loc. Costs (\$)	Est Total Cost (\$)
Less Than 1,000	\$8.50	17,492	\$148,680	\$5.40	\$94,460
1,000 - 2,500	6.00	16,983	101,900	3.00	50,950
2,500 - 5,000	3.70	3,923	14,520	1.30	5,100
5,000 - 10,000	2.80	10,901	30,520	0.90	9,810
Over 10,000	2.40	-----	-----	0.80	-----
Total	\$6.00	49,299	\$295,520	\$3.25	\$160,320

SOURCE: (1) Estimated cost from King Research, Inc. compilation of data
(2) Total number of loans from Arizona Public Library Statistics 1988 - 1989
(3) Calculations by King Research, Inc.

Above, one can see that there are considerable borrowing costs associated with bibliographic verification, identification and location of lending sources. Of the estimated \$295,520 cost associated with the borrowing of materials, \$160,320 (or over one-half) involves these activities.

Economies of scale of these activities are such that the "critical mass" is above, about 2,500 items borrowed, and 34,475 (or 70%) of the items borrowed came from libraries that borrow fewer than 2,500 items. If large libraries were to perform these activities (at an average of \$1.10 per item requested), substantial savings would be achieved (\$106,090). Thus, by shifting borrowing activities of verification, location and lending to larger libraries or centers, a total of about \$185,000 can be saved the Arizona library community.

- o The above savings can be achieved through the use of the following protocols:
Any bibliographic searching, verification, and location should only be done by libraries having more than 2,500 transactions per year. These delegated activities could be done by county/district libraries or a central source such as AILLC. With this protocol a total of two or three libraries would have sufficient numbers of requests to do the work themselves (Glendale, Mesa, Sierra Vista), several county/district libraries would process requests from libraries in their counties (Maricopa, Gila, Cochise, Coconino, Pima, Yavapai and maybe Navaho and Yuma). The rest of the libraries would go directly to a central source(s).
- o Requests for loans from individual libraries, county/district libraries or the central source(s) should be made only from designated lending libraries/center(s) that are operating above the "critical mass," which is in the neighborhood of 5,000 items loaned.

Ideally, the library or center receiving the initial request to search and verify could and should also fill the loan requests for a high (say at least one-half) proportion of requests. Phoenix Public Library, for example, currently satisfies 52 percent of requests sent to AILLC.

SECTION 4

OPTIONS FOR FUTURE DEVELOPMENT

4.1 INTRODUCTION

The economic analysis of interlibrary loan and reference referral in Arizona demonstrates the potential cost savings that could be achieved through centralizing functions and activities and taking advantages of economies of scale. Because of the relatively low number of both interlibrary loan and reference referral transactions initiated annually on a per library basis, these analyses indicate the advisability of the continued operation of an interlibrary loan and a reference referral center in the State.

Even though it appears that State centers for interlibrary loan request processing and reference referral should continue to exist, there are still a number of options open to Arizona libraries in the structure and procedures for statewide interlibrary loan and reference referral. The options tend to fall into two main categories:

- o how individual libraries or groups of libraries will interact with the center or with each other
- o what types of technologies might be employed to support the process of interlibrary loan and reference referral

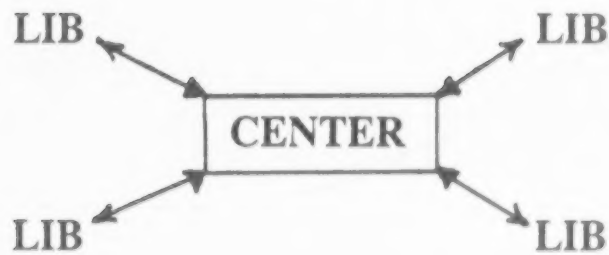
Finally, we include an evaluation of a totally decentralized option for interlibrary loan to demonstrate the effect of not operating some centralized processing facility.

There are basically four structural options that might be used in Arizona for interlibrary loan and/or reference referral. These structure options are displayed on Figure 4.1 on the next two pages. The first structure is "centralized" in which all libraries send their requests to a center and the center responds directly back to requesting libraries. The principal advantages of this structure are that economies of scale are achieved and protocol is simple. The

FIGURE 4.1

STRUCTURE OPTIONS

CENTRALIZED



► REQUEST
> RESPONSE

DECENTRALIZED

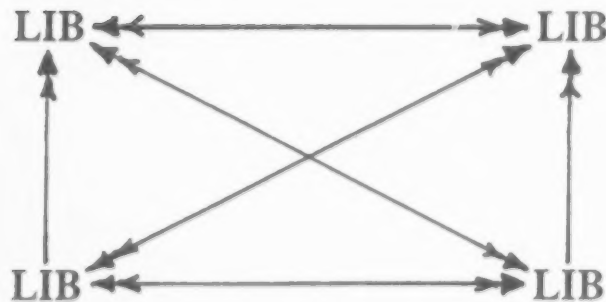
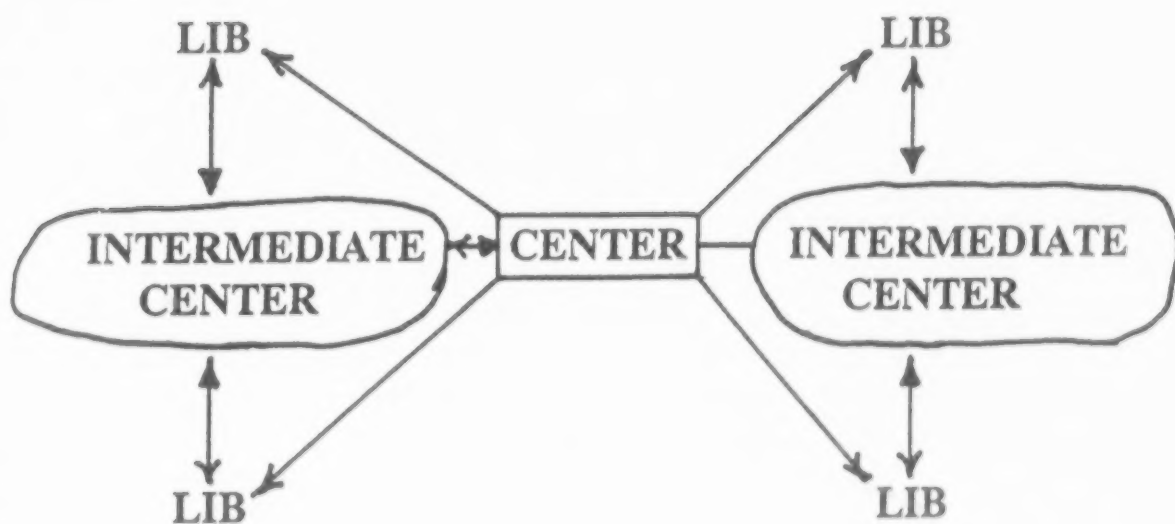
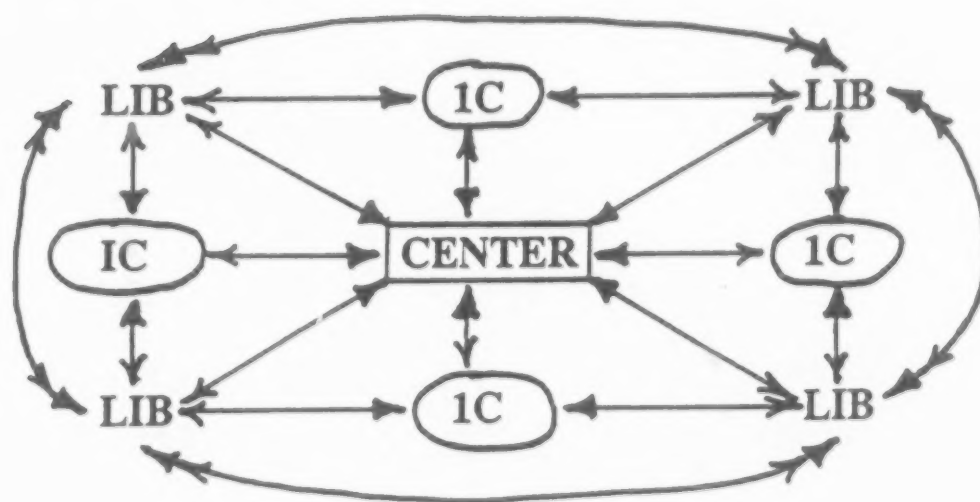


FIGURE 4.1 (CONT.)

HIERARCHICAL



HYBRID



disadvantage is that one center can process requests, but not fill all of them. Of course there could be several such centers in the State. The second structure is one in which all libraries deal only among themselves. This "decentralized" system has the advantage of leaving the responsibility of lending to local libraries. However, in addition to substantial costs as shown below, this option requires extensive and expensive identification and location tools. The third system is "hierarchical" in which protocols require that requests be processed up a hierarchy from a library to an intermediate center (say, county/district library) to a regional or state center such as AILLC or SRC. The advantages of this system are its simplicity, economies over either totally centralized or decentralized structures and enhanced relationships between libraries and intermediate centers. Disadvantages are that response times suffer and greater economies can be achieved through a "hybrid" structure as shown in Figure 4.1. In a hybrid structure libraries have the option of requesting (1) among themselves (say, special or school library to public library in a town), (2) from an intermediate center or (3) state center, depending on available resources, response time requirements and so on.

4.2 OPTIONS FOR INTERLIBRARY LOAN

The description of options for interlibrary loan in Arizona is multilayered. At the top layer are the **structural** options. For interlibrary loan we have defined these as:

- o totally centralized structure
- o hierarchical structure
- o modified hybrid structure
- o totally decentralized structure

The second layer of options relate to how libraries will interact with each other and, in the case of the hybrid structure, with the center. We can call this set of options **protocol** options. They are:

- o direct point-to-point
- o through intermediate center
- o through statewide center (e.g. AILLC)

The third layer of options relate to the technology that can be used to support the interlibrary loan process. These we refer to as **technology** options. They are:

- o OCLC/Group Access
- o CD-ROM
- o linked integrated library systems

From the above sets of options we can derive a number of different "network" options. In order to keep the evaluation process to a manageable size we will not consider every possible combination of the above options. Instead we will define what we consider to be "reasonable" options based on our experience in other similar environments and on new developments in both technology and practice.

The likelihood of implementing a totally centralized approach to interlibrary loan in Arizona is very small. The reason for this lies in the varying stages of resource and technological development exhibited among Arizona libraries. Libraries that have participated

in database development activities, such as OCLC, have had the capability for some time now to identify libraries holding needed materials and to place interlibrary loan requests directly with those libraries. There is no reason for those libraries to be forced to submit their requests to a center for processing as this would only increase the turnaround time of the request thereby deteriorating service to the library user.

This argument holds true, perhaps even more so, for the hierarchical structure. As more layers are added to the structure, the overall cost increases and the responsiveness of the service to the library user tends to deteriorate.

The trend in the evolution of statewide interlibrary loan networks has been from centralized structures to fairly rigid hierarchical structures and, today, is moving towards fully decentralized structures. The main problem faced by most states is that not all libraries are ready for the decentralized structure. Consequently, while a fully decentralized approach may be a long-term goal for development, most states end up with (whether they planned it or not) some form of hybrid structure.

For the purposes of this study we have defined two generic interlibrary loan network options.

- o totally decentralized structure using OCLC/GAC, CD-ROM or linked systems
- o hybrid system with varying protocols using OCLC/GAC, CD-ROM or linked systems

4.2.1 OPTION 1. TOTALLY DECENTRALIZED STRUCTURE

In this option the process of interlibrary loan would decentralize to the point whereby each library would send interlibrary loan requests directly to the libraries capable of filling them. This would mean that the interlibrary loan transactions currently referred to AILLC would be sent directly to the holding library. The overall pattern of interlibrary loan in Arizona would change dramatically.

4.2.2 OPTION 2. HYBRID STRUCTURE

This option is based on a modified version of today's network of interlibrary loan in Arizona. In this structure, some libraries would place interlibrary loan requests directly with the holding libraries. This point-to-point channel will be used by OCLC members who can place requests directly through the interlibrary loan subsystem of OCLC. In some areas, public libraries that are part of a sufficiently large library system will send requests to their county or district library systems for processing. Requests received by these "intermediate centers" will be processed, verified and filled if possible either by the center's host library or by an identified holding library, and unfilled requests will be referred to AILLC for fulfillment or further processing. All other libraries will send their requests directly to AILLC for processing.

4.2.3 SUBOPTIONS

In order for the first option in particular to work, it would be necessary to know what each library in Arizona holds. This could be achieved through the development of a statewide database of library holdings. Such a database could be developed and distributed in a number of different ways. In the technology options listed above we defined three different technological developments which could support a statewide database of library holdings.

Suboption 1

One option is to use OCLC's Group Database and Access Capabilities. Through this service group databases can be created (for example to include the holdings of libraries in a particular state) on OCLC's online system. The machine-readable records of non-cataloging members of OCLC can be loaded into the Group Database at a cost of \$0.10 or more per record. Once the group's records are in OCLC's Online Union Catalog, OCLC executes an automated profiling procedure to put all these records into a single database. The database is available to all OCLC members and non-member group participants as an integrated subset of the OCLC Online Union Catalog. The group database can be accessed by all the standard Union Catalog access points. Group participants first search the Online Union Catalog for a

bibliographic record and then identify which members of the group hold the identified item. OCLC cataloging members will see holdings for all OCLC members. The non-cataloging members, called selective users, see abbreviated bibliographic records and only holdings of libraries in their defined groups. However, requests that cannot be satisfied within the group can be referred to libraries outside the group by OCLC member libraries participating in the group on behalf of the selective users.

A further capability offered by OCLC is the Interlibrary Loan Subsystem. Through the subsystem, libraries may place requests for identified items electronically. Up to five holding libraries may be specified. The cost to place an interlibrary loan request through the Subsystem is \$1.00 - 1.11 per item request. In addition to holding libraries, the Subsystem also provides electronic access to several document providers including the British Library Document Supply Center, Chemical Abstracts Service, the Library of Congress, the National Agricultural Library, the National Technical Information Service and University Microfilms International.

Suboption 2

The second option is the development of a statewide database on CD-ROM. Several states are now distributing their databases on this relatively new medium. Pennsylvania and Wisconsin are two states that distribute their databases in this way. For this option (in the decentralized model) each library would need a microcomputer workstation with a CD-ROM drive. The cost of this equipment is of the order of magnitude of \$4,000, although a library having the microcomputer would only need to acquire the CD-ROM drive and controller at a cost of about \$600-700. Other costs that would be incurred with this option include the processing of data tapes prior to mastering of the disks, the mastering costs and the cost of reproducing the disks.

Suboption 3

The third option listed is the linking of integrated library systems in the state. This is the newest option and the least well-developed. It is relatively straightforward to link various

installations of the same integrated library system. However, linking different systems requires significantly more complex interfaces. Some libraries have experimented and operate in a linked systems model using the Irving Network. The Irving network consists of hardware and software that links similar and dissimilar integrated library systems together. It allows the user of one system to query another system without having to learn the query language of the second or subsequent systems. The costs associated with linking systems however, are relatively high and the performance of the systems in terms of response times is poor relative to the performance of one's own local system.

4.3 FEASIBILITY OF OPTIONS FOR ILL

4.3.1 TECHNICAL FEASIBILITY

The technical feasibility of the two main options (i.e., totally decentralized vs. hybrid) for interlibrary loan are similar. The technical feasibility of the various suboptions, however, does differ from suboption to suboption and for suboptions across the two main options.

It is technically feasible today to establish a group database with group access on OCLC. In fact, such a database could include the existing SOLAR serials union list database as an integrated database or it could be set up as a separate database. Libraries that are already members of OCLC could continue to use the system. Libraries that are not currently members of OCLC but which initiate a sizeable number of interlibrary loan requests could become selective users, as could libraries with bibliographic records in machine-readable form.

In both the decentralized and hybrid cases, the arrangements for the group database and group access could be negotiated and coordinated through the State Library. In the hybrid case though, it would make sense for the intermediate centers and AILLC to become the first tier of selective users along with individual libraries reaching above or about the "critical mass" of requests.

In both options the participating libraries would have to have the access equipment necessary to use the OCLC database and subsystem. This requires a dumb terminal and modem only. However, we recommend, particularly for the centers in the hybrid structure, that OCLC terminals (M310s) be used.

The advantage of the OCLC/GAC approach is the integration of database access and interlibrary loan request placement in a single system. Furthermore, it is an approach which builds upon a considerable investment made by some of the libraries in the State to place their holdings into the OCLC database (4.8 million records).

It is also technically feasible today to take the machine-readable bibliographic and holdings information for Arizona libraries from a number of different sources (OCLC, RLIN, Bibfile, etc.), process them and master a statewide database on CD-ROM. The individual libraries would have to have a microcomputer and CD-ROM player to access the database. Updates to the database could be produced monthly, quarterly, semi-annually, etc. according to need and cost.

The advantage of this approach to accessing a statewide database is that libraries could search the database without having to worry about telecommunications charges. The cost of accessing the database is a predictable amount. However, the disadvantage of this approach is that there would still need to be a mechanism for request placement. This could be any of the methods currently used: mail, telephone, fax, courier, delivery van, etc.

The technical feasibility of a linked systems approach is currently limited. For each different integrated library system, a new software interface needs to be developed/acquired. Already, several different automated library systems have been identified in Arizona. However, many of them only handle circulation control and not online public access modules. While it would still be possible (technically) to link these circulation systems, the database searching capabilities are likely to be much less flexible than if online catalog modules were being linked.

The advantage of this approach over the previous two approaches is that it offers the opportunity to immediately obtain current circulation status for needed items. The disadvantage of this approach is that the requesting library has to send its request from one system to another to identify a holding library, a process which can be time consuming. A second disadvantage is that telecommunications costs can quickly add up. Finally, this approach only includes libraries that have automated library systems, although other libraries could dial into the network.

4.3.2 ECONOMIC FEASIBILITY

The economic feasibility of the alternatives was based on available cost data and represent order of magnitude costs rather than detailed actual costs. The reasons why specific detailed costs are unavailable at this time is because there are so many suboptions available to the libraries. The economic feasibility analyses were also based on a number of assumptions as follows:

- o the total number of interlibrary loan requests initiated by Arizona libraries is 113,889
- o the number of Arizona libraries participating in interlibrary loan is 1,430
- o in the decentralized option, all requests are sent directly to the owning library
- o in the hybrid option requests are sent either directly to the owning library, to an intermediate center or to AILLC
- o in the hybrid option, only 60 libraries would be members of OCLC/GAC or would have a CD-ROM

The costs of the various options and suboptions are estimated as:

Decentralized Option

- | | | |
|---|----------------|--|
| o | OCLC/GAC | \$ 4,339,338 or \$4,121,973 without the ILL requesting costs |
| o | CD-ROM | \$ 7,152,768 |
| o | Linked systems | \$25,060,800 or \$19,340,800 without the ILL licenses |

The five year costs of these three decentralized approaches are:

- o OCLC/GAC \$11,084,801 or \$9,997,976 without the ILL requesting costs
- o CD-ROM \$11,326,080
- o Linked systems \$43,982,400 or \$38,262,400 without the ILL licenses

Hybrid Option

- o OCLC/GAC \$ 795,768 or \$578,403 without the ILL requesting costs
- o CD-ROM \$ 673,216
- o Linked systems \$ 1,147,000 or \$907,000 without the ILL licenses

The five year costs of these three hybrid approaches are:

- o OCLC/GAC \$ 1,731,948 or \$645,123 without the ILL requesting costs
- o CD-ROM \$ 848,320
- o Linked systems \$ 2,011,000 or \$1,771,000 without the ILL license

The details concerning these costs are found in Tables 4.1 through 4.9 at the end of this section.

4.3.3 OPERATIONAL FEASIBILITY

The operational feasibility of the options varies both for the different structures (and their associated protocols) as well as for the technologies used. The operational feasibility refers to the effect of the option on the libraries' procedures and day-to-day operations.

In the decentralized option, a library would bear all the responsibility of bibliographic verification, identification of the requested item and location of a holding library. For very small libraries this could place a considerable burden on already limited staff resources.

The burden placed at the local library would vary according to the technological option selected. The OCLC member library would search the OCLC database and place a request for identified items with identified holding libraries. If using OCLC/GAC, the local library would access OCLC through its workstation (dial access for selective users), search the bibliographic

database to identify requested items, display holdings if available within the group, place a request with up to five libraries (typically listing a full OCLC member in the group as the fifth library in the queue so that if the item is not available from any of the other libraries in the queue, the full OCLC member can place a request with a non-member of the group on behalf of the requesting library), or use another mechanism to request the identified item from the identified library. If using a CD-ROM database, the libraries would search the CD-ROM database to identify needed items and holding libraries in Arizona, and then use one of a number of mechanisms to place a request with an identified holding library. Finally, if using linked systems, the requesting library would, after searching its own online catalog, send the search query to other systems on the network to identify a library that both holds the item and has it available. The requesting library would then place a request message electronically with the identified library.

In the hybrid option, OCLC member libraries would search the OCLC database and place requests with identified holding libraries. Public libraries that are part of a library system would send their requests to the county or district library for processing. The county or district library would then use one of the three technological options described above. Requests which could not be dealt with by the county or district library would be referred on to AILLC. Other libraries which have a sizable number of interlibrary loan requests annually would be able to use one of the three technological options in a point-to-point mode. All other libraries would send their requests directly to AILLC for processing. AILLC would use one of the three technological options as described above.

4.4 RECOMMENDATIONS FOR INTERLIBRARY LOAN

Based on all the analyses performed as part of this study, we recommend that the interlibrary loan structure in Arizona be a hybrid structure as described above. We believe that such a structure provides the best overall system for interlibrary loan. It allows libraries that have invested in the use of automated systems and services to take advantage of them (which they would do anyway), and it allows libraries that do not have the financial or staff resources to acquire or use these technologies a mechanism for participating in the system. Furthermore,

it allows libraries in Arizona to achieve and take advantage of economies of scale associated with centralized operations.

In addition to the recommendation of the hybrid structure, we recommend the following protocols:

- o libraries with access to OCLC and RLIN should continue to use them for interlibrary loan
- o AILLC and county and district libraries handling a sufficient volume of interlibrary loan requests (Maricopa, Gila, Cochise, Coconino, Pima, Yavapai, and perhaps Navaho and Yuma) should become selective users of OCLC if they are not already full members
- o libraries with a sizeable volume of interlibrary loan requests annually should become selective users of OCLC if they are not already full members (Glendale, Mesa, Sierra Vista among public libraries)
- o libraries in counties and districts with a significant volume of interlibrary loan requests (Maricopa, Gila, Cochise, Coconino, Pima, Yavapai, and perhaps Navaho and Yuma) should submit their requests to their county/district libraries for processing
- o all other libraries should submit their interlibrary loan requests to AILLC for processing

Finally, as indicated above, we recommend the use of OCLC's Group Access Capability for a statewide database of library holdings. We recommend that this database be set up to incorporate the SOLAR database. Furthermore, we recommend that when the SHAREPAC CD-ROM product is released by OCLC (anticipated during Fall 1990) the possible use of the CD-ROM version of the database with its tie-in to the interlibrary loan subsystem be considered for some Arizona libraries.

TABLE 4.1
OCLC GAC COSTS (1)

Group Access Set-Up

One-time processing fee	\$ 440
Profiling	\$ 44 per library
Incorporation into group database	\$ 99 per 10 libraries
OCLC profiling fee	\$ 145
AMIGOS start-up fee	\$ 60 per library
Annual service fee	\$ 275 per library per year
Training	\$ 1,000 plus \$1,500 per 10 libraries

Equipment

M310 workstation	\$2,343 per library
Workstation maintenance	\$ 504 per terminal per year
Modem	\$ 50 per library
Telecommunications access	\$ 55 per library per year

Database loading

Compatible format records	\$ 0.10 per record
Non-compatible format records	\$ 0.20 per record

Transaction fees

Serials requests	\$ 1.00 per request
Other materials requests	\$ 1.11 per request
Online telecommunications	\$ 9.90 per hour

SOURCE: King Research, Inc.

- (1) These costs were provided by OCLC. Note that AMIGOS costs have not yet been finalized. Those costs are used for comparative purposes only and while they are in the range of the costs of GAC for other states they should not be considered binding.

TABLE 4.2

TOTAL COST OF OCLC GAC IN ARIZONA - DECENTRALIZED OPTION

		Total Costs	
		One time (\$)	Annual Recurring (\$)
<u>Group Access Set-Up</u>			
One-time processing fee	\$ 440	400	--
Profiling	\$ 44 X 1,390	61,160	--
Incorporation into group database	\$ 99 X 139	13,761	--
OCLC profiling fee	\$ 145	145	--
AMIGOS start-up fee	\$ 60 X 1,390	83,400	--
Annual service fee	\$ 275 X 1,390	--	382,250
Training	\$1,000 + 1,500 X 139	209,500	--
<u>Equipment</u>			
M310 workstation	\$2,343 X 1,390	3,256,770	--
Workstation maintenance	\$ 504 X 1,390	--	700,560
Modem	\$ 50 X 1,390	69,500	--
Telecommunications access	\$ 55 X 1,390	--	76,450
<u>Database loading</u>			
Compatible format records	\$0.10 X 3.07 mil.	307,000	--
Non-compatible format records	\$0.20 X 1.00 mil.	200,000	--
<u>Transaction fees</u>			
Serials requests	\$1.00 X 27,362	--	27,362
Other materials requests	\$1.11 X 86,527	--	96,045
Online telecommunications	\$9.90 X 5	--	93,958
	----- X \$113,889		
	60		
Total		4,201,676	1,376,625

SOURCE: King Research, Inc.

TABLE 4.3

TOTAL COST OF OCLC GAC IN ARIZONA - HYBRID OPTION

		Total Costs	
		One time (\$)	Annual Recurring (\$)
<u>Group Access Set-Up</u>			
One-time processing fee	\$ 440	440	--
Profiling	\$ 44 X 20	880	--
Incorporation into group database	\$ 99 X 2	198	--
OCLC profiling fee	\$ 145	145	--
AMIGOS start-up fee	\$ 60 X 20	1,200	--
Annual service fee	\$ 275 X 20	--	5,500
Training	\$1,000 + 1,500 X 2	4,000	--
<u>Equipment</u>			
M310 workstation	\$2,343 X 20	46,860	--
Workstation maintenance	\$ 504 X 20	--	10,080
Modem	\$ 50 X 20	1,000	--
Telecommunications access	\$ 55 X 20	--	1,100
<u>Database loading</u>			
Compatible format records	\$0.10 X 3.07 million	307,000	--
Non-compatible format records	\$0.20 X 1.00 million	200,000	--
<u>Transaction fees</u>			
Serials requests	\$1.00 X 27,362	--	27,362
Other materials requests	\$1.11 X 86,527	--	96,045
Online telecommunications	\$9.90 X 5	--	93,958
	----- X 113,889		
	60		
Total		561,723	234,0455

SOURCE: King Research, Inc.

TABLE 4.4
CD-ROM COSTS (1)

Database Building

OCLC Administrative fee	\$ 340
OCLC Set-up fee	\$1,000
OCLC Record processing	\$ 0.15 per title record
Tapes	\$ 30 per tape

CD-ROM Vendor Processing

Upgrading non-MARC records	\$ 0.10 per record
Processing all records for database	\$ 0.05 per title record

Database Production

Mastering and reproduction	\$ 62.40 per copy
----------------------------	-------------------

Equipment

Workstation	\$4,000 per library
Workstation maintenance	\$ 480 per workstation per year

SOURCE: King Research, Inc.

(1) These costs were based on the products of a database of about 9 million records (which reduce to about 2.4 million unique records) and prevailing costs of WISCHT, the Wisconsin (CD-ROM catalog).

TABLE 4.5
TOTAL COST OF CD-ROM IN ARIZONA - DECENTRALIZED OPTION

		Total Costs	
		One time (\$)	Annual Recurring (\$)
<u>Database Building</u>			
OCLC Administrative fee	\$ 340	340	---
OCLC Set-up fee	\$1,000	1,000	---
OCLC Record processing	\$0.5 X 1.1 mil.	165,000	---
Tapes	\$30 X 120	3,600	---
<u>CD-ROM Vendor Processing</u>			
Upgrading non-MARC records	\$0.10 X 1.0 mil.	100,000	---
Processing all records for database	\$0.05 X 2.39 mil.	119,500	---
<u>Database Production</u>			
Mastering and reproduction	\$62.40 X 1,430 X 4	---	356,928
<u>Equipment</u>			
Workstation	\$4,000 X 1,430	5,720,000	---
Workstation maintenance	\$480 X 1,430	---	686,400
Total		6,109,440	1,043,328

SOURCE: King Research, Inc.

TABLE 4.6
TOTAL COST OF CD-ROM IN ARIZONA - HYBRID OPTION

		Total Costs	
		One time (\$)	Annual Recurring (\$)
<u>Database Building</u>			
OCLC Administrative fee	\$ 340	340	---
OCLC Set-up fee	\$1,000	1,000	---
OCLC Record processing	\$0.5 X 1.1 mil.	165,000	---
Tapes	\$30 X 120	3,600	---
<u>CD-ROM Vendor Processing</u>			
Upgrading non-MARC records	\$0.10 X 1.0 mil.	100,000	---
Processing all records for database	\$0.05 X 2.39 mil.	119,500	---
<u>Database Production</u>			
Mastering and reproduction	\$62.40 X 60 X 4	---	14,976
<u>Equipment</u>			
Workstation	\$4,000 X 60	240,000	---
Workstation maintenance	\$480 X 60	---	28,800
Total		629,440	43,776

SOURCE: King Research, Inc.

TABLE 4.7
LINKED SYSTEM COSTS (1)

Basic host interface	\$2,000 per library
Customized host interface	\$7,500 per unique automated system
Customized host interface	\$5,000 per non-unique system
ILL license	\$4,000 per library
Basic user interface	\$1,000 per unique automated system
Customized user interface	\$2,000 per non-unique automated system
Host/user interface PC hardware	\$2,500 per library
Installation and training	\$1,000 per 10 libraries
Maintenance	\$3,600 per host interface

SOURCE: King Research, Inc.

- (1) These costs are based on recent costs quoted for the Irving system. These costs are for comparative purposes only and while they are in the range of costs provided to other states they should not be considered binding.

TABLE 4.8
TOTAL COST OF LINKED SYSTEMS
IN ARIZONA - DECENTRALIZED OPTION

		Total Costs	
		One time (\$)	Annual Recurring (\$)
Basic host interface	\$ 2,000 x 1,314	2,628,000*	---
Customized host interface	\$ 7,500 x 10	75,000	---
Customized host interface	\$ 5,000 x 1,304	6,520,000	---
ILL license	\$ 4,000 x 1,430	5,720,000	---
Basic user interface	\$ 1,000 x 1,314	1,314,000*	---
Customized user interface	\$ 2,000 x 1,314	2,628,000	---
Host/user interface			
PC hardware	\$ 2,500 x 1,314	3,285,000	---
Installation and training	\$ 1,000 x 132	131,400	---
Maintenance	\$ 3,600 x 1,314	---	4,730,400
Total		22,301,400	4,730,400
Discounted Total		20,330,400	4,730,400

SOURCE: King Research, Inc.

Full price but 50% volume discount would apply

TABLE 4.9

TOTAL COST OF LINKED SYSTEMS IN ARIZONA - HYBRID OPTION

		Total Costs	
		One time (\$)	Annual Recurring (\$)
Basic host interface	\$ 2,000 x 60	120,000(1)	---
Customized host interface	\$ 7,500 x 10	75,000	---
Customized host interface	\$ 5,000 x 50	250,000	---
ILL license	\$ 4,000 x 60	240,000	---
Basic user interface	\$ 1,000 x 60	60,000(1)	---
Customized user interface	\$ 2,000 x 60	120,000	---
Host/user interface			
PC hardware	\$ 2,500 x 60	150,000	---
Installation and training	\$ 1,000 x 6	6,000	---
Maintenance	\$ 3,600 x 60	---	216,000
Total		1,021,000	216,000
Discounted total		931,000	216,000

SOURCE: King Research, Inc.

(1) Full price but 50% volume discount would apply

APPENDIX A

RFP SCOPE OF WORK



SCOPE OF WORK

STATE PURCHASING OFFICE
1688 W. ADAMS, RM 220
PHOENIX, ARIZONA 85007-2687
(602) 255-5511

SOLICITATION NO. _____ A9-0508 _____

PART TWO

SCOPE OF WORK

1. GENERAL REQUIREMENTS: The contractor shall have the capability and requisite experience to provide the professional services in accordance with the provisions and requirements set forth in this agreement.
 - 1.1 The contractor shall provide specific, clearly-defined options for sharing information and bibliographic resources. The contractor shall narrow the options to a few reasonable possibilities. The intent shall be to focus on positive options, not to cause confusion in the library community by failing to narrow the choices. The contractor shall not limit these options to the creation of one large hierarchical network which attempts to address all activities and all needs.
 - 1.2 The contractor shall document these options as to:
 - Feasibility
 - Achievability
 - Projected cost; and
 - How well they address statewide library needs.
 - 1.3 The contractor shall propose strategies for implementing the options. The proposed strategies shall extend beyond technical implementation to include funding, protocols and other means of ensuring success.
 - 1.4 The contractor shall present a phased implementation schedule for implementing the options.
2. SPECIFIC TASKS: All contractor services shall be provided in accordance with the following:
 - 2.1 The contractor shall, within two (2) weeks of date of contract award, review existing background documents provided by the Agency.
 - 2.1.1 The contractor shall evaluate the relative strengths and weaknesses among all types of libraries in the State, with emphasis on identifying areas of strength that can serve as network nodes.



SCOPE OF WORK

STATE PURCHASING OFFICE

1688 W. ADAMS, RM 220
PHOENIX, ARIZONA 85007-2687
(602) 255-5511

SOLICITATION NO. A9-0508

2.1.1.1 New studies concerning existing data and systems shall be performed by the contractor only if the potential information yielded will contribute significantly towards identifying options for future development. New studies shall be specifically approved in advance by the director of the Agency prior to the contractor conducting said studies. The contractor should be thinking not in terms of studies, but of "options" and "action plans."

2.1.2 The contractor shall identify needs that can be addressed by resource sharing, computer networks, and other kinds of networks. In addition, the contractor shall identify expectations that are not appropriate for resource sharing and networks.

2.2 The contractor shall, within four (4) weeks of date of contract award, meet with the Agency for review of existing resource/networking activities currently in place within the State.

2.2.1 Specifically, contractor shall analyze and provide a relative evaluation of existing state supported resource-sharing activities - AILLC, ARIC, and SOLAR - with respect to cost and to effectiveness in addressing existing and projected needs.

2.3 The contractor shall, within ten (10) weeks of date of contract award, develop conceptual models/options for sharing information and bibliographic resources (i.e. networking).

2.3.1 The contractor shall evaluate the feasibility of using models which have been implemented in other states.

2.3.2 The contractor shall evaluate areas of technology relating to resource sharing with respect to current state of the art and industry trends, including, but not limited to, the following:

- Bibliographic utilities that might enhance the exchange of materials or bibliographic information, focusing on cost and accessibility.
- Other centralized, vended library resources, such as online information sources.
- Data communications and telecommunications (including all methods, such as fiber-optics, satellite, microwave, digital wide area networks, etc.).



SCOPE OF WORK

STATE PURCHASING OFFICE

1688 W. ADAMS, RM 220
PHOENIX, ARIZONA 85007-2687
(602) 255-5511

SOLICITATION NO. A9-0508

- Local library computer systems, including system capabilities, system incompatibilities, ease of networking, standardization of user interfaces, and prevalence of certain types of systems.
 - The trend towards increased capabilities at the local system level - for example, large databases on CD-ROM, full text retrieval, multiple databases on a single online system.
- 2.3.3 The contractor shall evaluate methods and/or opportunities to encourage input and "buy-in" by the library community and funding sources.
- 2.3.4 The contractor shall identify policy questions which the Agency and/or the library community would need to address in considering the networking options under study.
- 2.3.5 The contractor shall provide cost data or estimates thereof for the networking options presented.
- 2.4 The contractor shall, within twelve (12) weeks of contract award, meet with the Agency to discuss networking options.
- 2.4.1 The contractor shall work in conjunction with the Agency to evaluate the appropriateness and feasibility of the various networking option(s), and thereby make preliminary decisions upon the implementation of subject option(s), to be finalized in a subsequent Final Report.
- 2.5 The contractor shall, within twenty-two (22) weeks of date of contract award, submit to the Agency a Draft Report detailing the implementation of aforementioned (subsection 2.4.1) appropriate and feasible networking option(s).
- 2.6 The contractor shall, within ^{three 3} ~~four (4)~~ weeks after submittal of Draft Report to Agency, meet with the Agency to discuss the findings and contents of subject Draft Report.
- 2.7 The contractor shall, within ^{three 3} ~~four (4)~~ weeks of Agency approval of Draft Report, submit to Agency a Final Report.
- 2.7.1 Final Report shall address any concerns and/or issues raised by the Agency in their review of the Draft Report.



SCOPE OF WORK

STATE PURCHASING OFFICE
1888 W. ADAMS, RM 220
PHOENIX, ARIZONA 85007-2887
(602) 255-5511

SOLICITATION NO. A9-0508

- 2.8 The Agency reserves the right to require assessment and/or evaluation of issues or concerns in either the Draft Report or the Final Report in the event that the Agency determines said issues or concerns were not adequately addressed in either of the two (2) reports.

APPENDIX B

GLOSSARY OF TERMS

&

DATA COLLECTION FORMS

- Large public libraries
- Other public libraries
- Large academic libraries
- Other academic libraries
- School libraries
- Special libraries

GLOSSARY OF TERMS

Academic libraries include all libraries in major universities such as University of Arizona and State University of Arizona, as well as two-year and community colleges.

Arizona Interlibrary Loan Center (AILLC) at the Phoenix Public Library is a center funded by the Arizona State Department of Library, Archives, and Public Records. Its principal function is to process ILL requests through (1) fulfillment or (2) referral to a library that can fill the request.

Delivery van should include any van that is or can be used to deliver ILL and RR requests, interlibrary loaned items and other library materials. The van can be district or county.

Interlibrary loan (ILL) includes lending of materials among libraries of any type (i.e., among school libraries within and among school districts, public libraries, academic libraries and special libraries). Types of loaned materials include books, periodicals (journal articles, newspapers, magazines, etc.), audio-visual and other materials. Both actual documents and photocopies are to be included.

MARC records are electronic or machine-readable catalog records prepared by the Library of Congress. They are prepared with very specific rules and formats. Non-MARC records are all other machine-readable catalogs.

OCLC is a non-profit organization in Ohio that has developed a computer database of MARC records for the purpose of providing access to original catalogs (to assist cataloging) and catalog cards or machine-readable catalogs. They also provide, among other services, an integrated library automation system.

Other Automated Library Systems should include systems built on machine-readable catalog or bibliographic records.

"Other" libraries include Library for the Blind, libraries at correctional institutions, etc. When in doubt record in "other" and we will reclassify, if necessary.

Public libraries include traditional local public libraries as well as county or district libraries that service public libraries in a county or district.

Reference referral (RR) includes referral of reference requests (from patrons) among libraries of any type (i.e., among school libraries within and among school districts, public libraries, academic libraries and special libraries). Examples of reference requests include bibliographic citations (i.e., titles, authors, dates, etc. of books, periodicals, etc., or all books written by A. Conan Doyle), brief answers to questions (e.g., the capital of Bolivia?), detailed answers to questions (e.g., does cold water or hot water freeze faster and why?), and in-depth answers to inquiries (e.g., dealing with a term paper).

Special libraries include libraries in Federal, state and local government agencies, companies, hospitals, law firms, and other such organizations. The patrons of special libraries are generally professionals and other organization employees.

State Reference Center is a center also funded and operated by the Arizona State Department of Library, Archives, and Public Records to answer reference inquiries with answers to questions, bibliographic citations or documents which answer questions. Until July of this year, this center was operated by the Tucson Public Library (Arizona Research and Information Center - ARIC).

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We hope to have a 100 percent response from public libraries. If every public library will respond within two weeks, we can report some preliminary results at the ASLA meeting in early November. Please return questionnaires to:

King Research, Inc.
P.O. Box 1098
Rockville, MD 20849-1098

If you have any questions concerning the survey, please contact Dr. Jose-Marie Griffiths or Mr. Donald W. King at (301) 738-1341 (between 8:00 AM and 2:00 PM Arizona time).

THE FIRST SET OF QUESTIONS DEALS WITH YOUR LIBRARY'S CURRENT AND PLANNED USE OF TECHNOLOGY.

1. Please indicate the approximate number of your library's titles in machine-readable catalog records. (INDICATE 0, IF NONE.)

_____ in MARC _____ in non-MARC _____ in OCLC

2. Please indicate your current and planned use of technology in your library. (CIRCLE APPROPRIATE RESPONSE.)

	Currently Have	Planned Within 5 Years	Neither Have Nor Plan To Have in 5 Years
A. OCLC	1	2	3
B. Other Automated Library Systems (please specify)			
B1. _____	1	2	3
B2. _____	1	2	3
C. Facsimile transmission	1	2	3
D. Microcomputers/terminals	1	2	3
E. Microform readers	1	2	3
F. Delivery van	1	2	3
G. Telephone	1	2	3

THE QUESTIONS BELOW REFER ONLY TO THE LAST ITEM BORROWED (THROUGH ILL) BY YOUR LIBRARY. NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT BORROWED IN THE LAST 12 MONTHS, CHECK HERE _____ AND SKIP TO QUESTION 14.

3. What type of material was borrowed? (CIRCLE APPROPRIATE RESPONSE.)
 Book.....1 Audio-visual.....3
 Journal article...2 Other (please specify): _____ ..4
4. Was the request for a specific author/title or a subject request?
 Author/title.....1 Subject request.....2
5. Did you verify bibliographic citation prior to submitting the request?
 Yes.....1 No.....2 Don't Know.....3
6. Did you identify and locate the holding library prior to submitting the request?
 Yes.....1 No.....2 Don't Know.....3
7. From what type of library/center did you make the initial request?
 Public library.....1 Special library.....4
 Academic library.....2 School library.....5
 AILLC/Phoenix PL.....3 Other (specify): _____ ..6
8. Was this a rush request (i.e., needed within 2 or 3 days)?
 Yes.....1 No.....2
9. How many times (i.e., to how many libraries) did you submit the request until it was filled? (CIRCLE APPROPRIATE RESPONSE.)
 Once...1 Twice...2 Three Times...3 Over 3 times...4
10. How was the request made?
 Mail.....1 Electronic Mail.....5
 Courier.....2 OCLC.....6
 Fax.....3 Delivery Van.....7
 Phone.....4 Other (specify): _____ ..8
- 11A. From where did you receive the borrowed item?
 Request was never filled....1 Special library.....5
 Public library.....2 School library.....6
 Academic library.....3 Other (specify): _____ ..7
 AILLC/Phoenix PL.....4

11B. Was this library/center the same one to which you sent your final request?

Yes.....1 No.....2 Don't Know.....3

12. How was the item sent to you?

Mail.....1 Delivery Van.....4
 Courier.....2 Other (specify): 5
 Fax.....3

13. Approximately how long was it from the time you sent the first request until the time you received the item?

_____ days

THE FOLLOWING QUESTIONS REFER ONLY TO THE LAST REFERENCE REQUEST MADE BY YOUR LIBRARY TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER (FORMERLY ARIC). NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT MADE A REFERENCE REQUEST TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER IN THE LAST 12 MONTHS CHECK HERE _____ AND YOUR RESPONSE IS COMPLETED.

14. What type of reference request was made?

Bibliographic citation(s).....1
 Answer to brief question (e.g., year of Arizona statehood?).....2
 Answer to a detailed question (e.g., how do you fix a leaking faucet or how do you treat poison ivy?).....3
 In-depth answer to an inquiry (e.g., what are tax laws concerning separation/divorce?).....4
 Other (please specify): 5

15. From what type of library/center did you make the initial request?

Public library.....1 Special library.....4
 Academic library.....2 School library.....5
 State Ref. Ctr. (ARIC)....3 Other (specify): 6

16. Was this a rush request (i.e., needed within 2 or 3 days)?

Yes.....1 No.....2

17. How many times (i.e., to how many libraries) did you submit the request until it was filled? (CIRCLE APPROPRIATE RESPONSE)

Once...1 Twice...2 Three Times...3 Over 3 times...4

18. How was the request made? (CIRCLE MORE THAN ONE RESPONSE, IF APPROPRIATE.)

Mail.....1	Electronic Mail.....5
Courier.....2	Online.....6
Fax.....3	Delivery Van.....7
Phone.....4	Other (specify): 8

19. What type of response did you receive? (CIRCLE ALL THAT APPLY.)

Never received a response.....1	Document(s).....5
Bibliographic citation(s).....2	Other (specify): 7
Specific answer to question...3	

- 20A. From where did you receive this response?

Public library.....1	Special library.....4
Academic library.....2	School library.....5
State Ref. Ctr.(ARIC)....3	Other (specify): 6

- 20B. Was this library/center the same one to which you sent your final request?

Yes.....1 No.....2

21. How was the response sent to you?

Mail.....1	Electronic Mail.....5
Courier.....2	Online.....6
Fax.....3	Delivery Van.....7
Phone.....4	Other (specify): 8

22. Approximately how long was it from the time you sent the first request until the time you received the response?

_____ days

THANK YOU VERY MUCH!

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_____ in MARC _____ in non-MARC _____ in OCLC

2. Please indicate your current and planned use of technology in your library. (CIRCLE APPROPRIATE RESPONSE.)

	Currently Have	Planned Within 5 Years	Neither Have Nor Plan To Have in 5 Years
A. OCLC	1	2	3
B. Other Automated Library Systems (please specify)			
B1. _____	1	2	3
B2. _____	1	2	3
C. Facsimile transmission	1	2	3
D. Microcomputers/terminals	1	2	3
E. Microform readers	1	2	3
F. Delivery van	1	2	3
G. Telephone	1	2	3

YOUR LIBRARY HAS BEEN REPORTED HAVING BORROWED _____ ITEMS IN THE LAST YEAR.

3. About what proportion OR number of the borrowed items are of the following types? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Books	_____ %	OR	_____ items
Journal articles	_____ %	OR	_____ items
Audio-visual materials	_____ %	OR	_____ items
Other materials (specify):			
_____	_____ %	OR	_____ items
_____	_____ %	OR	_____ items

4. About what proportion or number of items were requested from the following types of libraries? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Public libraries	_____ %	OR	_____ items
Academic libraries	_____ %	OR	_____ items
AILLC/Phoenix Public Library	_____ %	OR	_____ items
Special libraries	_____ %	OR	_____ items
School libraries	_____ %	OR	_____ items
Other (please specify):			
_____	_____ %	OR	_____ items
_____	_____ %	OR	_____ items

5. Approximately what proportion of the requests are rush (i.e., needed within 2 or 3 days)?

_____ % of requests

6. About what proportion or number of items were requested by the following means? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Mail	_____ %	OR	_____ items
Courier	_____ %	OR	_____ items
Fax	_____ %	OR	_____ items
Phone	_____ %	OR	_____ items
Electronic Mail	_____ %	OR	_____ items
OCLC	_____ %	OR	_____ items
Delivery Van	_____ %	OR	_____ items
Other (please specify):			

124 _____ % OR _____ items

7. About what proportion or number of the borrowed items were received from the following types of libraries? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Public libraries	_____ %	OR	_____ items
Academic libraries	_____ %	OR	_____ items
AILLC/Phoenix Public Library	_____ %	OR	_____ items
Special libraries	_____ %	OR	_____ items
School libraries	_____ %	OR	_____ items
Other (please specify):			
_____	_____ %	OR	_____ items
_____	_____ %	OR	_____ items

8. About what proportion or number of the borrowed items were received by the following means? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Mail	_____ %	OR	_____ items
Courier	_____ %	OR	_____ items
Fax	_____ %	OR	_____ items
Delivery Van	_____ %	OR	_____ items
Other (please specify):			
_____	_____ %	OR	_____ items

9. About what proportion of the requests were received within:

_____ % one day
 _____ % two to five days
 _____ % six to ten days
 _____ % 11 to 20 days
 _____ % over 20 days
 _____ % were never received.

PLEASE INDICATE THE NUMBER OF REFERENCE REQUESTS YOUR LIBRARY HAS MADE TO OTHER LIBRARIES OR THE STATE REFERENCE CENTER (FORMERLY THE ARIZONA RESEARCH & INFORMATION CENTER - ARIC) IN THE LAST YEAR. _____ REQUESTS

10. About what proportion OR number of reference requests were of the following types? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Bibliographic citations	_____ %	OR	_____ items
Answers to brief questions (e.g., year of Arizona statehood?)	_____ %	OR	_____ items
Answers to detailed questions (e.g., how do you fix a leaking faucet, or how do you treat poison ivy?)	125 %	OR	_____ items

PLEASE INDICATE EITHER:

PROPORTION OR ACTUAL NUMBER

Indepth answers to inquiries (e.g.,
what are the tax laws concerning
separation/divorce?)

_____ % OR _____ items

Other (please specify):

_____ % OR _____ items

_____ % OR _____ items

11. About what proportion or number of initial reference requests were made from the following types of libraries? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

PROPORTION OR ACTUAL NUMBER

Public libraries _____ % OR _____ items

Academic libraries _____ % OR _____ items

State Reference Center (ARIC) _____ % OR _____ items

Special libraries _____ % OR _____ items

School libraries _____ % OR _____ items

Other (please specify):

_____ % OR _____ items

_____ % OR _____ items

12. Approximately what proportion of the reference requests are rush (i.e., needed within 2 or 3 days)?

_____ % of requests

13. About what proportion or number of items were requested by the following means? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

PROPORTION OR ACTUAL NUMBER

Mail _____ % OR _____ items

Courier _____ % OR _____ items

Fax _____ % OR _____ items

Phone _____ % OR _____ items

Electronic Mail _____ % OR _____ items

OCLC _____ % OR _____ items

Delivery Van _____ % OR _____ items

Other (please specify):

_____ % OR _____ items

14. About what proportion OR number of responses did you receive of the following types? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

PROPORTION OR ACTUAL NUMBER

Never received responses _____ % OR _____ items

Bibliographic citations _____ % OR _____ items

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1. Please indicate the approximate number of your library's titles in machine-readable catalog records. (INDICATE 0, IF NONE.)

_____ in MARC _____ in non-MARC _____ in OCLC

2. Please indicate your current and planned use of technology in your library. (CIRCLE APPROPRIATE RESPONSE.)

	Currently Have	Planned Within 5 Years	Neither Have Nor Plan To Have in 5 Years
A. OCLC	1	2	3
B. Other Automated Library Systems (please specify)			
B1. _____	1	2	3
B2. _____	1	2	3
C. Facsimile transmission	1	2	3
D. Microcomputers/terminals	1	2	3
E. Microform readers	1	2	3
F. Delivery van	1	2	3
G. Telephone	1	2	3

PLEASE INDICATE THE NUMBER OF ITEMS YOUR LIBRARY HAS BORROWED FROM OTHER LIBRARIES OR THE STATE REFERENCE CENTER (FORMERLY THE ARIZONA RESEARCH & INFORMATION CENTER - ARIC) IN THE LAST YEAR. _____ ITEMS

3. About what proportion OR number of the borrowed items are of the following types? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Books	_____ %	OR	_____ items
Journal articles	_____ %	OR	_____ items
Audio-visual materials	_____ %	OR	_____ items
Other materials (specify):			
_____	_____ %	OR	_____ items
_____	_____ %	OR	_____ items

4. About what proportion or number of items were requested from the following types of libraries? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Public libraries	_____ %	OR	_____ items
Academic libraries	_____ %	OR	_____ items
AILLC/Phoenix Public Library	_____ %	OR	_____ items
Special libraries	_____ %	OR	_____ items
School libraries	_____ %	OR	_____ items
Other (please specify):			
_____	_____ %	OR	_____ items
_____	_____ %	OR	_____ items

5. Approximately what proportion of the requests are rush (i.e., needed within 2 or 3 days)?

_____ % of requests

6. About what proportion or number of items were requested by the following means? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Mail	_____ %	OR	_____ items
Courier	_____ %	OR	_____ items
Fax	_____ %	OR	_____ items
Phone	_____ %	OR	_____ items
Electronic Mail	_____ %	OR	_____ items
OCLC	_____ %	OR	_____ items
Delivery Van	_____ %	OR	_____ items
Other (please specify):			
_____	_____ %	OR	_____ items

7. About what proportion or number of the borrowed items were received from the following types of libraries? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Public libraries	_____ %	OR	_____ items
Academic libraries	_____ %	OR	_____ items
AILLC/Phoenix Public Library	_____ %	OR	_____ items
Special libraries	_____ %	OR	_____ items
School libraries	_____ %	OR	_____ items
Other (please specify):			
_____	_____ %	OR	_____ items
_____	_____ %	OR	_____ items

8. About what proportion or number of the borrowed items were received by the following means? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Mail	_____ %	OR	_____ items
Courier	_____ %	OR	_____ items
Fax	_____ %	OR	_____ items
Delivery Van	_____ %	OR	_____ items
Other (please specify):			
_____	_____ %	OR	_____ items

9. About what proportion of the requests were received within:

_____ % one day
 _____ % two to five days
 _____ % six to ten days
 _____ % 11 to 20 days
 _____ % over 20 days
 _____ % were never received.

PLEASE INDICATE THE NUMBER OF REFERENCE REQUESTS YOUR LIBRARY HAS MADE TO OTHER LIBRARIES OR THE STATE REFERENCE CENTER (FORMERLY THE ARIZONA RESEARCH & INFORMATION CENTER - ARIC) IN THE LAST YEAR. _____ REQUESTS

10. About what proportion OR number of reference requests were of the following types? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:	<u>PROPORTION</u>	OR	<u>ACTUAL NUMBER</u>
Bibliographic citations	_____ %	OR	_____ items
Answers to brief questions (e.g., year of Arizona statehood?)	_____ %	OR	_____ items
Answers to detailed questions (e.g., how do you fix a leaking faucet, or how do you treat poison ivy?)	129	% OR	_____ items

PLEASE INDICATE EITHER:**PROPORTION OR ACTUAL NUMBER**

Indepth answers to inquiries (e.g.,
what are the tax laws concerning
separation/divorce?)

_____ % OR _____ items

Other (please specify):

_____ % OR _____ items

_____ % OR _____ items

11. About what proportion or number of initial reference requests were made from the following types of libraries? **(INDICATE 0, IF NONE.)**

PLEASE INDICATE EITHER:**PROPORTION OR ACTUAL NUMBER**

Public libraries

_____ % OR _____ items

Academic libraries

_____ % OR _____ items

State Reference Center (ARIC)

_____ % OR _____ items

Special libraries

_____ % OR _____ items

School libraries

_____ % OR _____ items

Other (please specify):

_____ % OR _____ items

_____ % OR _____ items

12. Approximately what proportion of the reference requests are rush (i.e., needed within 2 or 3 days)?

_____ % of requests

13. About what proportion or number of items were requested by the following means? **(INDICATE 0, IF NONE.)**

PLEASE INDICATE EITHER:**PROPORTION OR ACTUAL NUMBER**

Mail

_____ % OR _____ items

Courier

_____ % OR _____ items

Fax

_____ % OR _____ items

Phone

_____ % OR _____ items

Electronic Mail

_____ % OR _____ items

OCLC

_____ % OR _____ items

Delivery Van

_____ % OR _____ items

Other (please specify):

_____ % OR _____ items

14. About what proportion OR number of responses did you receive of the following types? **(INDICATE 0, IF NONE.)**

PLEASE INDICATE EITHER:**PROPORTION OR ACTUAL NUMBER**

Never received responses

_____ % OR _____ items

Bibliographic citations

_____ % OR _____ items

PLEASE INDICATE EITHER:

Specific answers to questions

PROPORTION OR ACTUAL NUMBER

_____ % OR _____ items

Documents

_____ % OR _____ items

Other (please specify):

_____ % OR _____ items

_____ % OR _____ items

15. About what proportion or number of responses were received from the following types of libraries? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

Public libraries

PROPORTION OR ACTUAL NUMBER

_____ % OR _____ items

Academic libraries

_____ % OR _____ items

AILLC/Phoenix Public Library

_____ % OR _____ items

Special libraries

_____ % OR _____ items

School libraries

_____ % OR _____ items

Other (please specify):

_____ % OR _____ items

_____ % OR _____ items

16. About what proportion or number of items were sent to you by the following means? (INDICATE 0, IF NONE.)

PLEASE INDICATE EITHER:

Mail

PROPORTION OR ACTUAL NUMBER

_____ % OR _____ items

Courier

_____ % OR _____ items

Fax

_____ % OR _____ items

Phone

_____ % OR _____ items

Electronic Mail

_____ % OR _____ items

OCLC

_____ % OR _____ items

Delivery Van

_____ % OR _____ items

Other (please specify):

_____ % OR _____ items

17. About what proportion of the requests were received within:

_____ % one day

_____ % two to five days

_____ % six to ten days

_____ % 11 to 20 days

_____ % over 20 days

_____ % were never received.

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_____ in MARC _____ in non-MARC _____ in OCLC

2. Please indicate your current and planned use of technology in your library. (CIRCLE APPROPRIATE RESPONSE.)

	Currently Have	Planned Within 5 Years	Neither Have Nor Plan To in 5 Years
A. OCLC	1	2	3
B. Other Automated Library Systems (please specify)			
B1. _____	1	2	3
B2. _____	1	2	3
C. Facsimile transmission	1	2	3
D. Microcomputers/terminals	1	2	3
E. Microform readers	1	2	3
F. Delivery van	1	2	3
G. Telephone	1	2	3

3. Approximately how many items have you borrowed from other libraries in the last 12 months? (INDICATE 0, IF NONE.)

Books..... _____ items Audio-visual materials..... _____ items
Journal articles _____ items Other (specify): _____ .. _____ items

4. Approximately how many requests for loans have been made to your library by other libraries in the last 12 months? (INDICATE 0, IF NONE.)

Books..... _____ requests Audio-visual materials..... _____ requests
Journal articles _____ requests Other (specify): _____ .. _____ requests

5. Approximately how many of these requests did your library refer to other libraries or the Arizona ILL Center at Phoenix Public Library (AILLC)? (INDICATE 0, IF NONE.)

Books..... _____ requests Audio-visual materials..... _____ requests
Journal articles _____ requests Other (specify): _____ .. _____ requests

6. Approximately how many items have you loaned to other libraries? (INDICATE 0, IF NONE.)

Books..... _____ items Audio-visual materials..... _____ items
Journal articles _____ items Other (specify): _____ .. _____ items

7. Approximately how many reference requests has your library made to other libraries or the State Reference Center in the last 12 months? (INDICATE 0, IF NONE.)

_____ requests

8. Approximately how many reference requests have been made to your library by other libraries in the last 12 months? (INDICATE 0, IF NONE.)

_____ requests

9. Approximately how many of these requests did your library fill and how many did you refer to other libraries or the State Reference Center? (INDICATE 0, IF NONE.)

_____ req's. filled by your library _____ req's. referred elsewhere

THE QUESTIONS BELOW REFER ONLY TO THE LAST ITEM BORROWED (THROUGH ILL) BY YOUR LIBRARY. NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT BORROWED IN THE LAST 12 MONTHS, CHECK HERE _____ AND SKIP TO QUESTION 18.

10. What type of material was borrowed? (CIRCLE APPROPRIATE RESPONSE.)

Book.....1 Audio-visual.....3
Journal article...2 Other (please specify): _____ ..4

11. Was the request for a specific author/title or a subject request?
 Author/title.....1 Subject request.....2
12. From what type of library/center did you make the initial request?
 Public library.....1 Special library.....4
 Academic library.....2 School library.....5
 AILLC/Phoenix PL.....3 Other (specify): 6
13. Was this a rush request (i.e., needed within 2 or 3 days)?
 Yes.....1 No.....2
14. How was the request made?
 Mail.....1 Electronic Mail.....5
 Courier.....2 OCLC.....6
 Fax.....3 Delivery Van.....7
 Phone.....4 Other (specify): 8
15. From where did you receive the borrowed item?
 Request was never filled....1 Special library.....5
 Public library.....2 School library.....6
 Academic library.....3 Other (specify): 7
 AILLC/Phoenix PL.....4
16. How was the item sent to you?
 Mail.....1 Delivery Van.....4
 Courier.....2 Other (specify): 5
 Fax.....3
17. Approximately how long was it from the time you sent the first request until the time you received the item?
 _____ days

THE FOLLOWING QUESTIONS REFER ONLY TO THE LAST REFERENCE REQUEST MADE BY YOUR LIBRARY TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER (FORMERLY ARIZONA RESEARCH & INFORMATION CENTER - ARIC). NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT MADE A REFERENCE REQUEST TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER IN THE LAST 12 MONTHS CHECK HERE _____ AND YOUR RESPONSE IS COMPLETED.

18. What type of reference request was made?
 Bibliographic citation(s).....134.....1
 Answer to brief question (e.g., year of Arizona statehood?).....2

18. CONTINUED

Answer to a detailed question (e.g., how do you fix a leaking faucet or how do you treat poison ivy?).....3

In-depth answer to an inquiry (e.g., what are tax laws concerning separation/divorce?).....4

Other (please specify): 5

19. From what type of library/center did you make the initial request?

Public library.....1 Special library.....4

Academic library.....2 School library.....5

State Ref. Ctr.(ARIC)....3 Other (specify): 6

20. Was this a rush request (i.e., needed within 2 or 3 days)?

Yes.....1 No.....2

21. How was the request made? (CIRCLE MORE THAN ONE RESPONSE, IF APPROPRIATE.)

Mail.....1 Electronic Mail.....5

Courier.....2 Online.....6

Fax.....3 Delivery Van.....7

Phone.....4 Other (specify): 8

22. What type of response did you receive? (CIRCLE ALL THAT APPLY.)

Never received a response.....1 Document(s).....5

Bibliographic citation(s).....2 Other (specify): 7

Specific answer to question...3

23. From where did you receive this response?

Public library.....1 Special library.....4

Academic library.....2 School library.....5

State Ref. Ctr.(ARIC)....3 Other (specify): 6

24. How was the response sent to you?

Mail.....1 Electronic Mail.....5

Courier.....2 Online.....6

Fax.....3 Delivery Van.....7

Phone.....4 Other (specify): 8

25. Approximately how long was it from the time you sent the first request until the time you received the response?

_____ days

King Research, Inc.

6000 Executive Boulevard, Rockville, Maryland 20852 (301) 881-6766

Dear Librarian:

As you may know, King Research, Inc. has been asked to perform a study of interlibrary loan (ILL) and reference referral (RR) networking in Arizona as part of the Arizona Long-Range Library Plan. Although this Plan is being developed under the auspices of the Department of Library, Archives, and Public Records, school library media specialists have been included in the planning process from the start, and school objectives are included for each goal.

The purpose of the study is to recommend future networking options for the libraries in Arizona. We need to know your current and planned capabilities and the ways in which ILL and RR are now being performed.

Below are some data that we need from you. We hope to have a high response from school libraries. Please return the questionnaire to:

King Research, Inc.
P.O. Box 1098
Rockville, MD 20849-1098

If you have any questions concerning the survey, please contact Dr. Jose-Marie Griffiths or Mr. Donald W. King at (301) 738-1341 (between 8:00 AM and 2:00 PM Arizona time). A glossary of terms is attached to assist you in answering the questions.

THE FIRST SET OF QUESTIONS DEALS WITH INTERLIBRARY LOAN (ILL).

SECTION 1

Through a formal interlibrary loan (ILL) mechanism, libraries in Arizona can borrow books, periodicals, audio-visual and other materials from other libraries (other school, public, academic, special) and a specially designated Center at Phoenix Public Library (AILLC).

1. Are you aware of interlibrary loan (ILL) within the state?

Yes.....1 No.....2

2. Do you currently participate in interlibrary loan (ILL) activities?

Yes.....1 [SKIP TO QUESTION 3.]

No.....2

If no, would you be willing to participate as a lender and borrower in ILL?
[CIRCLE ALL APPROPRIATE RESPONSES.]

- Maybe, if I knew more about it.....1
Yes, only if permitted by local board policy.....2
Yes, within district.....3
Yes, statewide.....4
No.....5

SKIP TO SECTION 2 ON PAGE 4.

3. Approximately how many items have you borrowed from other libraries in the last 12 months (on behalf of your school)? Note that you might do this through interlibrary loan or through your library card. (INDICATE 0, IF NONE.)

Books..... ____ items Audio-visual materials..... ____ items
Periodicals..... ____ items Other (specify): ____ items

4. Approximately how many requests for interlibrary loans have been made to your library by other libraries in the last 12 months? (INDICATE 0, IF NONE.)

Books..... ____ requests Audio-visual materials..... ____ requests
Periodicals..... ____ requests Other (specify): ____ requests

5. Approximately how many of these requests did your library refer on to other libraries or the Arizona ILL Center at Phoenix Public Library (AILLC)? (INDICATE 0, IF NONE.)

Books..... ____ requests Audio-visual materials..... ____ requests
Periodicals..... ____ requests Other (specify): ____ requests

6. Approximately how many items have you loaned to other libraries? (INDICATE 0, IF NONE.)

Books..... ____ items Audio-visual materials..... ____ items
Periodicals..... ____ items Other (specify): ____ items

THE QUESTIONS BELOW REFER ONLY TO THE LAST ITEM BORROWED (THROUGH ILL) BY YOUR LIBRARY. NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT BORROWED IN THE LAST 12 MONTHS, CHECK HERE _____ AND SKIP TO SECTION 2 ON PAGE 4.

7. What type of material was borrowed? (CIRCLE APPROPRIATE RESPONSE.)
- Book.....1 Audio-visual.....3
- Periodical.....2 Other (please specify): 4
8. Was the request for a specific author/title or a subject request?
- Author/title.....1 Subject request.....2
9. To what type of library/center did you make the initial request?
- Public library.....1 Special library.....4
- Academic library.....2 School library.....5
- AILLC/Phoenix PL.....3 Other (specify): 6
10. Was this a rush request (i.e., needed within 2 or 3 days)?
- Yes.....1 No.....2 Don't know.....3
11. How was the request made?
- Mail.....1 Electronic Mail.....5
- Courier.....2 OCLC.....6
- Fax.....3 Delivery Van.....7
- Phone.....4 Other (specify): 8
12. From where did you receive the borrowed item?
- Request was never filled....1 Special library.....5
- Public library.....2 School library.....6
- Academic library.....3 Other (specify): 7
- AILLC/Phoenix PL.....4
13. How was the item sent to you?
- Mail.....1 Delivery Van.....4
- Courier.....2 Other (specify): 5
- Fax.....3
14. Approximately how long was it from the time you sent the first request until the time you received the item?

_____ days

SECTION 2

Libraries in Arizona can, through a formal reference referral (RR) mechanism, refer reference questions (particularly difficult ones) to other libraries and a specially designated State Reference Center (once called Arizona Research and Information Center - ARIC).

15. Are you aware of reference referral (RR) within the state?

Yes.....1 No.....2

16. Do you currently participate in reference referral (RR) activities?

Yes.....1 [SKIP TO QUESTION 17.]

No.....2

If no, would you be willing to participate as a user and provider of reference services? [CIRCLE ALL APPROPRIATE RESPONSES.]

Maybe, if I knew more about it.....1

Yes, only if permitted by local board policy.....2

Yes, within district.....3

Yes, statewide.....4

No.....5

SKIP TO SECTION 3 ON PAGE 6.

17. Approximately how many reference requests has your library made to other libraries or the State Reference Center in the last 12 months? (INDICATE 0, IF NONE.)

_____ requests

18. Approximately how many reference requests have been made to your library by other libraries in the last 12 months? (INDICATE 0, IF NONE.)

_____ requests

19. Approximately how many of these requests did your library fill and how many did you refer on to other libraries or the State Reference Center? (INDICATE 0, IF NONE.)

_____ req's. filled by your library _____ req's. referred elsewhere

THE FOLLOWING QUESTIONS REFER ONLY TO THE LAST REFERENCE REQUEST MADE BY YOUR LIBRARY TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER (FORMERLY ARIZONA RESEARCH & INFORMATION CENTER - ARIC). NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT MADE A REFERENCE REQUEST TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER IN THE LAST 12 MONTHS CHECK HERE _____ AND SKIP TO SECTION 3 ON PAGE 6.

20. What type of reference request was made?
- Bibliographic citation(s).....1
- Answer to brief question (e.g., year of Arizona statehood?).....2
- Answer to a detailed question (e.g., how do you fix a leaking faucet or how do you treat poison ivy?).....3
- In-depth answer to an inquiry (e.g., what are tax laws concerning separation/divorce?).....4
- Other (please specify): 5
21. To what type of library/center did you make the initial request?
- Public library.....1 Special library.....4
- Academic library.....2 School library.....5
- State Ref. Ctr.(ARIC)....3 Other (specify): 6
22. Was this a rush request (i.e., needed within 2 or 3 days)?
- Yes.....1 No.....2
23. How was the request made? (CIRCLE MORE THAN ONE RESPONSE, IF APPROPRIATE.)
- Mail.....1 Electronic Mail.....5
- Courier.....2 Online.....6
- Fax.....3 Delivery Van.....7
- Phone.....4 Other (specify): 8
24. What type of response did you receive? (CIRCLE ALL THAT APPLY.)
- Never received a response.....1 Document(s).....4
- Bibliographic citation(s).....2 Other (specify): 5
- Specific answer to question...3
25. From where did you receive this response?
- Public library.....1 Special library.....4
- Academic library.....2 School library.....5
- State Ref. Ctr.(ARIC)....3 Other (specify): 6

26. How was the response sent to you?

Mail.....1 Electronic Mail.....5
Courier.....2 Online.....6
Fax.....3 Delivery Van.....7
Phone.....4 Other (specify): 8

27. Approximately how long was it from the time you sent the first request until the time you received the response?

_____ days

SECTION 3

THIS SET OF QUESTIONS DEALS WITH YOUR LIBRARY'S CURRENT AND PLANNED USE OF TECHNOLOGY.

28. Please indicate the approximate number of your library's titles in machine-readable catalog records. (INDICATE 0, IF NONE.)

_____ in MARC _____ in non-MARC _____ in OCLC

29. Please indicate your current and planned use of technology in your library. (CIRCLE APPROPRIATE RESPONSE.)

	Currently Have	Planned Within 5 Years	Neither Have Nor Plan To Have in 5 Years
A. OCLC	1	2	3
B. Other Automated Library Systems (please specify)			
B1. _____	1	2	3
B2. _____	1	2	3
C. Facsimile transmission	1	2	3
D. Microcomputers/terminals	1	2	3
E. Microform readers	1	2	3
F. Delivery van	1	2	3
G. Telephone	1	2	3

30. Would you consider converting to MARC in the future if training were provided?

Yes.....1 No.....2 Maybe.....3

THANK YOU VERY MUCH!

King Research, Inc.

6000 Executive Boulevard, Rockville, Maryland 20852 (301) 881-6766

Dear Library Director:

As you may know, King Research, Inc. has been asked to perform a study of interlibrary loan (ILL) and reference referral (RR) networking in Arizona. The purpose of the project is to recommend future networking options for the libraries in Arizona which will serve your library more effectively in the future. In order for us to explore various options, we need to know your current and planned capabilities and the ways in which ILL and RR are now being performed. Below are some data that we need from your library. We have tried to keep the amount of data needed to a minimum.

We hope to have a high response from special libraries. Please return the questionnaire to:

King Research, Inc.
P.O. Box 1098
Rockville, MD 20849-1098

If you have any questions concerning the survey, please contact Dr. Jose-Marie Griffiths or Mr. Donald W. King at (301) 738-1341 (between 8:00 AM and 2:00 PM Arizona time).

THE FIRST SET OF QUESTIONS DEALS WITH YOUR LIBRARY'S CURRENT AND PLANNED USE OF TECHNOLOGY.

1. Please indicate the approximate number of your library's titles in machine-readable catalog records. (INDICATE 0, IF NONE.)

_____ in MARC _____ in non-MARC _____ in OCLC

2. Please indicate your current and planned use of technology in your library. (CIRCLE APPROPRIATE RESPONSE.)

	Currently Have	Planned Within 5 Years	Neither Have Nor Plan To Have in 5 Years
A. OCLC	1	2	3
B. Other Automated Library Systems (please specify)			
B1. _____	1	2	3
B2. _____	1	2	3
C. Facsimile transmission	1	2	3
D. Microcomputers/terminals	1	2	3
E. Microform readers	1	2	3
F. Delivery van	1	2	3
G. Telephone	1	2	3

3. Approximately how many items have you borrowed from other libraries in the last 12 months? (INDICATE 0, IF NONE.)

Books..... items Audio-visual materials..... items
Journal articles items Other (specify): .. items

4. Approximately how many requests for loans have been made to your library by other libraries in the last 12 months? (INDICATE 0, IF NONE.)

Books..... requests Audio-visual materials..... requests
Journal articles requests Other (specify): .. requests

5. Approximately how many of these requests did your library refer to other libraries or the Arizona ILL Center at Phoenix Public Library (AILLC)? (INDICATE 0, IF NONE.)

Books..... requests Audio-visual materials..... requests
Journal articles requests Other (specify): .. requests

6. Approximately how many items have you loaned to other libraries? (INDICATE 0, IF NONE.)

Books..... items Audio-visual materials..... items
Journal articles items Other (specify): .. items

7. Approximately how many reference requests has your library made to other libraries or the State Reference Center in the last 12 months? (INDICATE 0, IF NONE.)

requests

8. Approximately how many reference requests have been made to your library by other libraries in the last 12 months? (INDICATE 0, IF NONE.)

requests

9. Approximately how many of these requests did your library fill and how many did you refer to other libraries or the State Reference Center? (INDICATE 0, IF NONE.)

req's. filled by your library req's. referred elsewhere

THE QUESTIONS BELOW REFER ONLY TO THE LAST ITEM BORROWED (THROUGH ILL) BY YOUR LIBRARY. NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT BORROWED IN THE LAST 12 MONTHS, CHECK HERE AND SKIP TO QUESTION 18.

10. What type of material was borrowed? (CIRCLE APPROPRIATE RESPONSE.)

Book.....1 Audio-visual.....3
Journal article...2 Other (please specify): ..4

11. Was the request for a specific author/title or a subject request?
 Author/title.....1 Subject request.....2
12. From what type of library/center did you make the initial request?
 Public library.....1 Special library.....4
 Academic library.....2 School library.....5
 ALLC/Phoenix PL.....3 Other (specify): 6
13. Was this a rush request (i.e., needed within 2 or 3 days)?
 Yes.....1 No.....2
14. How was the request made?
 Mail.....1 Electronic Mail.....5
 Courier.....2 OCLC.....6
 Fax.....3 Delivery Van.....7
 Phone.....4 Other (specify): 8
15. From where did you receive the borrowed item?
 Request was never filled....1 Special library.....5
 Public library.....2 School library.....6
 Academic library.....3 Other (specify): 7
 ALLC/Phoenix PL.....4
16. How was the item sent to you?
 Mail.....1 Delivery Van.....4
 Courier.....2 Other (specify): 5
 Fax.....3
17. Approximately how long was it from the time you sent the first request until the time you received the item?
 _____ days

THE FOLLOWING QUESTIONS REFER ONLY TO THE LAST REFERENCE REQUEST MADE BY YOUR LIBRARY TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER (FORMERLY ARIZONA RESEARCH & INFORMATION CENTER - ARIC). NOTE THAT A REQUEST MIGHT NEVER HAVE BEEN FILLED.

IF YOUR LIBRARY HAS NOT MADE A REFERENCE REQUEST TO ANOTHER LIBRARY OR THE STATE REFERENCE CENTER IN THE LAST 12 MONTHS CHECK HERE _____ AND YOUR RESPONSE IS COMPLETED.

18. What type of reference request was made?
 Bibliographic citation(s).....144.....1
 Answer to brief question (e.g., year of Arizona statehood?).....2

18. CONTINUED

Answer to a detailed question (e.g., how do you fix a leaking faucet or how do you treat poison ivy?).....3

In-depth answer to an inquiry (e.g., what are tax laws concerning separation/divorce?).....4

Other (please specify): 5

19. From what type of library/center did you make the initial request?

Public library.....1 Special library.....4

Academic library.....2 School library.....5

State Ref. Ctr. (ARIC)....3 Other (specify): 6

20. Was this a rush request (i.e., needed within 2 or 3 days)?

Yes.....1 No.....2

21. How was the request made? (CIRCLE MORE THAN ONE RESPONSE, IF APPROPRIATE.)

Mail.....1 Electronic Mail.....5

Courier.....2 Online.....6

Fax.....3 Delivery Van.....7

Phone.....4 Other (specify): 8

22. What type of response did you receive? (CIRCLE ALL THAT APPLY.)

Never received a response.....1 Document(s).....5

Bibliographic citation(s).....2 Other (specify): 7

Specific answer to question...3

23. From where did you receive this response?

Public library.....1 Special library.....4

Academic library.....2 School library.....5

State Ref. Ctr. (ARIC)....3 Other (specify): 6

24. How was the response sent to you?

Mail.....1 Electronic Mail.....5

Courier.....2 Online.....6

Fax.....3 Delivery Van.....7

Phone.....4 Other (specify): 8

25. Approximately how long was it from the time you sent the first request until the time you received the response?

_____ days

APPENDIX C

SURVEY RELIABILITY

Estimates of proportions, averages, totals, etc. taken from the library survey are not likely to be the true population value. The difference between the survey estimates and true population values is attributable to survey errors. There are two types of error that can occur in surveys:

- o Sampling error: The difference between an estimate (e.g., proportion, average, total) and the true population value which is due to the fact that only a sample of values is observed. If the survey is a census (i.e., every library in a population is observed) there would be no sampling error. Sampling error can be estimated from a random sample and is called standard error. Precision of survey sample estimates is a function of sampling error.
- o Nonsampling error: This error, sometimes called bias, is that part of the difference between an estimate and the true population value which is due to mistakes in survey processes or impreciseness of survey communication. Nonsampling error is rarely attempted to be measured because of the extreme difficulty of doing so. Accuracy of survey sample estimates is a function of nonsampling error.

The total difference between survey estimates and true population values is due to a combination of these two types of errors in the following ways:

Sampling Errors

Precision of estimates from samples is measured by standard errors of estimates. Equations of standard error include the deviation responses from the true value and sample size. Examples of equations of standard error (SE) are as follows:

Proportion. The equation for the standard error of a proportion SE(p) is:

$$SE(p) = \frac{pq}{\sqrt{n}}$$

where: p is the estimate of the proportion of interest
q is the complement of p (i.e., 1-p)
n is the sample size.

Referring to Table 2.7 Rush Requests. We find that the proportion of rush requests are:

Public	4.8%
Academic	2.7%
School	21.0%
Special	18.6%

The sample size for public libraries is 72. Thus the standard error is 2.5%

The size of estimated standard error, in turn, is affected by four factors. Assume example confidence intervals for the estimated proportion of rush requests by public libraries is 0.05 (or 5%) with a simple random sample size of 72 might be displayed as:

5% $\pm$ 2.5% at 68% level of confidence

- (1) Sample size. For the example, the estimates above are estimated from a sample size of 72 observations. If one doubled the sample size to 144, the confidence interval would decrease from 2.5 percent to 1.8 percent at 68 percent level of confidence. If the sample were reduced to 36, the confidence interval would increase from 2.5 percent to 3.6 percent at 68 percent level of confidence.

- (2) Sample size relative to population size. If the sample size were in fact the entire population, the confidence interval would be zero. The example above assumes that the sample size is very small compared with the population size. Since the sample size of public libraries and academic libraries (72) is reasonably high compared with the population (131), there is some gain in reduced confidence intervals. For the example above, a sample of 72 is from a population of 131 libraries the confidence interval would fall from 2.5 percent to 1.7 percent.
- (3) Inherent variability of observations. For example, if amount of interlibrary lending and reference services ranges broadly, the confidence interval for the estimated average level of performance would probably be greater than estimates in which levels have a narrow range.
- (4) Statistical sample method. A survey can be improved in terms of decreasing estimated confidence levels (at a given sample size) by statistical sample methods (e.g., stratification, ratio estimation, etc.). We did stratify the sample, thus the actual estimates standard error are less than examples given above.

Examples of one standard error (i.e., 68% level of confidence) for various sample sizes and estimated proportions (%) are given below assuming a random sample:

Sample Size	Estimated Proportion					
	5%/95%	10%/90%	20%/80%	30%/70%	40%/60%	50%
25	4.3	6.0	8.0	9.2	9.8	10.0
50	3.1	4.2	5.7	6.5	6.9	7.1
75	2.5	3.5	4.6	5.3	5.7	5.8
100	2.2	3.0	4.0	4.6	4.9	5.0
150	1.8	2.4	3.3	3.7	4.0	4.1
200	1.5	2.1	2.8	3.2	3.5	3.5
250	1.4	1.9	2.5	3.0	3.1	3.2
400	1.1	1.5	2.0	2.3	2.4	2.5

Note that complementary proportions (i.e, 95% for 5%, 70% for 30%, etc.) have exactly the same standard errors. This table can be used to determine sample sizes initially or to test approximate statistical precision of survey results.

Non-sampling Error

Non-sampling errors are mistakes that creep into survey processes due to the following sources of error:

- o Improper questionnaire design
- o Development of a sampling frame
- o Errors due to nonresponse from a sampled unit
- o Errors in response to questions
- o Clerical processing error
- o Computing error
- o Analyst error
- o User error

These sources of error are addressed in the survey design and data processing methods that we used. For example, we pretested the questionnaire and the school questionnaire was given extensive review and language was changed to communicate in terms acceptable to school librarians. The response levels are well acceptable for public and academic libraries and less so for special libraries. School library results are lower than desirable, but the data are presented as evidence. All data are weighted to achieve unbiased estimates of population proportions, averages and totals. That is large public library responses are given a weight of 15 divided by 13, small public libraries 116 divided by 59, and so on (see Table 1.1).

APPENDIX D

SPECIAL ANALYSIS OF AILLC

D.1 Amount of Activity

The Arizona Interlibrary Loan Center (AILLC) reports four week samples of data for four quarters each year. For the year 1988/1989 the total was 5,009 or projected to the year, the estimate is 65,117 (52 - 4 x 5,009) requests. This number represents requests, not number of items requested or filled. Basically AILLC processes these requests and either fills them through the Phoenix Public Library (PPL) collection, refers the request through OCLC (or an ALA ILL form) or the request is cancelled. In addition AILLC processes requests from PPL patrons monthly through OCLC. Trend data provided to us by AILLC are as follows:

Total Amount of AILLC Activity: 1982 - 1989

Year	Total Non-PPL Requests	Non-PPL Requests Filled			PPL Requests Filled	
		Total	PPL	OCLC	Requests	Filled
1982/83	15,461	10,415	7,020	3,395	2,744	2,174
1983/84	21,626	16,558	8,824	7,734	3,433	2,850
1984/85	26,142	20,778	11,002	9,776	3,721	3,034
1985/86	37,374	28,570	15,558	12,982	4,475	3,624
1986/87	46,648	33,437	18,628	14,809	5,662	4,567
1987/88 (1)	52,212	39,552	21,956	17,596	6,354	5,154
1988/89	65,117	59,009	34,206	24,803	6,368	5,386

AILLC

- (1) 1st Quarter data times 4
- (2) Four week sample data reported to State Library
- (3) Note that using the 1st quarter data for 1988/89 as a projection would increase all 1987/88 data by a factor of 1.117 (i.e., total would be 59,554 instead of 52,212 requests)

Data for the year 1988/89 was categorized as follows:

Public Library

Coconino County	5,746
Yavapai County	3,965
Maricopa County	3,679
Pima County	3,094
Navajo County	2,834
Gila County	2,782
Cochise County	2,496
Apache County	1,690
Mohave County	1,196
Graham County	949
Santa Cruz County	559
Greenlee County	494
Pima County	403
Yuma County	338
LaPaz County	<u>182</u>
Total	30,407
College libraries (Arizona)	4,966
University libraries (Arizona)	598
School libraries	2,496
<u>Special Libraries</u>	
Business	4,537
State institutions	2,899
State agencies	1,482
Medical hospitals	637
Military bases	533
Law firms	<u>130</u>
Total	10,218
Out-of-State	9,685
Miscellaneous	<u>6,747</u>
Total	65,117

The services of AILLC are clearly multitype library services since requests come from such a broad range of types of libraries. Public libraries account for less than one-half of the requests (46.7%) not including requests originated by PPL patrons (5,386).

The requests can be subdivided into four basic types:

- o Books
- o Photocopy
- o Subject
- o Referral (PPL patrons)

The sources of request vary substantially among the types of request as shown below (where data are given):

<u>Source</u>	<u>Photocopy %</u>	<u>All Other %</u>
Public libraries	17.53%	53.30%
College and university libraries	20.54	5.83
School libraries	11.57	2.08
Special libraries	42.69	9.58
Out-of-state	6.81	16.70
Miscellaneous	<u>0.86</u>	<u>12.51</u>
Total	100.00%	100.00%

The proportion of requests shift dramatically away from public libraries, out-of-state and miscellaneous for books and subject requests to special libraries, and school libraries for photocopy requests. The total number of photocopy requests is 12,027 and the total number of requests for all other is 53,090.

Most of the requests came directly to AILLC (5,386 from PPL and 46,624 from other sources) but about one-fourth (18,493) came to AILLC though OCLC. Based on data reported to State Library the type of requests are as follows:

Type of Request	No. of Requests	Proportion (%)
Books	50,544	71.7%
Photocopy	12,027	17.1
Subject	2,546	3.6
Referral (PPL patrons)	5,386	7.6
Total	70,503	100.0

We made some assumptions concerning disposition of requests. First we assumed that each of the first three types of requests (non-PPL) were disposed in roughly the same manner; that is, 52.53 percent filled, 38.09 percent referred and 9.38 percent cancelled. Further, we assumed that subject requests were roughly filled in proportion of OCLC searches to other types of searches (i.e., 70% OCLC, 30% other) based on rough estimates from staff. Thus, we estimate that requests that are filled with books from PPL referred and cancelled are from the following type of requests:

Type of Request	Disposition			
	Filled	Referred	Cancelled	Total
Book	26,551	19,252	4,741	50,544
Subject	936	679	167	1,782
Total	27,487	19,931	4,908	52,326

Requests filled by photocopy are as follows:

Disposition				
Type of Requests	Filled	Referred	Cancelled	Total
Photocopy	6,318	4,581	1,128	12,027
Subject	401	291	72	764
Total	6,719	4,872	1,200	12,791

Thus, final disposition is aggregated as follows:

Filled by PPL

Books	27,487
Photocopy	6,719

Referred

OCLC	27,170
ALA form	3,019
Cancelled	<u>6,108</u>
Total	70,503

Referred include 5,386 requests from PPL patrons. Staff indicates that about 90% of the referrals are made through OCLC and the remainder area done manually through ALA ILL forms. These data are used to help compute average costs below.

D.2 Cost Finding

Cost finding at AILLC yielded the number of transactions, total costs and average costs for the following types of activities:

- o Process of initial requests
- o Verify and locate where items can be obtained
 - subject requests
 - requests for books or photocopies
 - requests that require difficult verification

Once requests are verified and items located, they are:

- o Either filled at PPL
 - books processed out
 - books processed in
- o Or they are referred to other libraries to be filled
 - through OCLC
 - through ALA ILL forms
- o Or requests are cancelled.

The number of transactions and costs for completing the transactions are given on Table 3.1 from Section 3. This table is reproduced below.

TABLE 3.1
 AILLC ACTIVITY AND COST
 Number of Transactions, Total Cost and Average Cost
 by Type Activity for AILLC: 1988/89

Type of Activity	No. of Transactions	Total Costs (\$)	Avg. Costs (\$)
Process initial requests	70,503	\$12,030	\$0.17
Verify/locate			
Subject	2,546	23,870	9.38
Books/photocopy	56,182	48,000	0.85
Difficult verification	<u>6,389</u>	<u>37,980</u>	<u>5.94</u>
Total	65,117	109,850	1.69
Filled requests (PPL)			
Books - out	27,487	69,290	2.52
- in	(27,487)	32,060	1.17
Photocopy	<u>6,719</u>	<u>38,580</u>	<u>5.74</u>
Total	34,206	139,930	4.09
Refer requests	30,189	79,730	2.64
Cancel	6,108	620	0.10

SOURCE: AILLC 1989/90 Projected Cost
 AILLC Sample Collections 1988/90
 King Research, Inc.

The data in Table 3.1 were obtained in the following manner.

(1) Total labor costs include salary and fringe benefits as follows:

<u>Employee</u>	<u>Wages</u>
6517	\$ 49,400
5062	23,300
3014	20,350
8545	20,350
57717	13,500
57917	13,500
58054	13,500
57959	13,500
57765	19,800
57790	19,800
57952	9,900
58010	<u>9,900</u>
Total	\$226,800

(2) The total labor costs are roughly allocated based on staff discussion as follows:

- o Direct labor costs are \$174,800 and indirect labor costs are \$52,000 (i.e., 6517 - \$40,100; 3062 - \$11,600; 57952 and 58010 - \$5,200) in labor and \$27,264 in space. The indirect costs (\$79,264) are considered overhead (OH) which are allocated to direct labor costs by a proportion (45.35%)

(3) Other direct costs (ODC) include:

<u>OCLC</u>	\$ 43,000
Postage	17,000
Supplies	5,000
Maintenance agreement	1,500
In-WATS	3,000
Equipment	<u>5,200</u>
Total	\$ 74,700

- (4) Administrative (PPL) costs are \$13,390 which are allocated to the sum of direct labor costs, overhead (OH) and other direct costs (ODC).

The wages/salaries of AILLC staff and other direct costs are allocated to various AILLC activities as shown on the tables on the next two pages.

Allocation of Staff Time to AILLC Activities

Wages/Salaries (\$)

Activity	Staff Members												Total
	6517	57785	57790	3082	3014	8545	57717	57917	58054	57959	57952	58010	
Process initial request		1,400	1,400				900	900		1,700			6,300
Verify/locate subject	2,800	5,000	5,000										12,800
Books/photocopy	1,200				3,200	3,900	4,200	4,200	4,700	5,000			26,400
Difficult verification	9,300	7,800	7,800										24,900
Filled request (PPL)													
Books out -					8,500	5,900	4,000	3,900	3,800	4,100	8,000		34,200
Books in -				11,700								9,500	21,200
Photo					8,000	5,400	3,350	3,350	1,800	2,700			22,600
Ref. requests		5,600	5,600		4,550	5,100	950	1,050	3,150				26,000
Cancel	100				50		100	100	50				400
Overhead	38,000			11,600	50	50				3,900		400	52,000
Total	49,400	19,800	19,800	23,300	20,350	20,350	13,500	13,500	13,500	13,500	9,900	9,900	228,800

Allocation of Other Direct Costs to ALLC Activities

Activity	Other Direct Cost Items (\$)					Total
	OCIC/ Equip.	Postage	Supplies	In- WATS	Space	
Process initial request				2,400		2,400
Verify/locate Subject	4,040			300		4,340
Books/photo	7,740					7,740
Difficult verification				300		300
Filled requests (PPL)						
Books-out		12,880	4,010			16,890
Books-in						—
Photo.		3,370	840			4,210
Ref. requests	37,920	750	150			38,820
Cancel						
Overhead 27,264					27,264	
Total	49,700	17,000	5,000	3,000	27,264	101,964

Direct labor, overhead, other direct and administrative costs are allocated (based on staff) as given below.

Process initial requests

- o Transactions - 70,503 requests
- o Direct labor costs - \$6,300
- o Overhead costs - \$2,860 (45.359% of \$6,300)
- o Other direct costs - \$2,400 (80% of In-WATS - \$3,000)
- o Administrative costs - \$470 (4.07% of \$11,560)
- o Total costs - \$12,030
- o Average costs - \$0.17 per transaction

Verify/locate - subject requests

- o Transactions - 2,546 subject requests
- o Direct labor costs - \$12,800
- o Overhead costs - \$5,800 (45.35% of \$12,800)
- o Other direct costs \$4,340 (In-WATS - \$300; OCLC and equipment - \$4,040)
- o Administrative costs - \$930 (4.07% of \$22,940)
- o Total costs - \$23,870
- o Average costs - \$9.38 per subject request

Verify/locate - book/photocopy requests

- o Transactions - 56,182 book/photocopy requests
- o Direct labor costs \$26,400
- o Overhead costs - \$11,980 (45.35% of \$26,400)
- o Other direct costs - \$7,740 (OCLC and equipment)
- o Administrative costs - \$1,880 (4.077% of \$46,120)
- o Total costs - \$98,000
- o Average costs - \$0.85

Verify/locate - difficult verification

- o Transactions - 6,389 difficult requests
- o Direct labor costs \$24,900
- o Overhead costs - \$11,290 (45.35% of \$24,900)
- o Other direct costs - \$300 (In-WATS - \$300)
- o Administrative costs - \$1,490 (4.07% of \$36,490)
- o Total costs - \$37,980
- o Average costs - \$5.94

Filled requests (PPL) - books out

- o Transactions - 27,487
- o Direct labor - \$34,200
- o Overhead costs - \$15,500 (45.35% of \$34,200)
- o Other direct costs - \$16,890 (postage - \$12,880; supplies - \$4,010)
- o Administrative costs - \$2,700 (4.07% of \$66,600)
- o Total costs - \$69,290
- o Average costs - \$2.52 per book

Filled requests (PPL) - books in

- o Transactions - 27,487
- o Direct labor costs - \$21,200
- o Overhead costs - \$9,610 (45.35% of \$21,200)
- o Other direct costs - 0
- o Administrative costs - \$1,250 (4.07% of \$30,810)
- o Total costs - \$32,060
- o Average costs - \$1.17

Filled requests (PPL) - photocopy

- o Transactions - 6,719
- o Direct labor costs \$22,600
- o Overhead costs - \$10,350 (45.359% of \$22,600)
- o Other direct costs - \$4,210 (postage - \$3,370; supplies \$840)
- o Administrative costs - \$1,510 (4.07% of \$37,060)
- o Total costs - \$38,570
- o Average costs - \$5.74

Refer Requests

- o Transactions 30,189
- o Direct labor costs \$26,000
- o Overhead costs \$11,790
- o Other direct costs - \$38,820 (OCLC and equipment \$37,920; postage - \$750; supplies - \$150)
- o Administrative costs - \$3,120
- o Total costs - \$79,730 -
- o Average costs \$2.64

Cancel

- o Transactions - 6,108
- o Direct labor costs - \$400
- o Overhead costs \$190
- o Other direct costs- \$0
- o Administrative costs - \$30
- o Total costs - \$620
- o Average costs \$0.10

APPENDIX E

SPECIAL ANALYSIS OF STATE REFERENCE CENTER

E.1 INTRODUCTION

Special analysis of State Reference Center service involved two components: inspection of a random sample of request forms and cost finding of specific functions performed by SRC staff. We took a sample of every 10th request and inspected the request form regarding type of request, staff member(s) involved, time spent by the staff member(s), duration of response time, and other relevant information. We examined 129 such request forms and, thus, assume the total number of requests from July 1, 1989 to early March 1990 to be about 1,300 requests. Results are summarized below. The second kind of analysis involved allocating staff time to various activities including request input and output processing, searching (brief, detailed and in-depth searches), administration (and supervision) and other functions such as public relations, continuing education, and so on.

E.2 AMOUNT OF ACTIVITY

A sample of 129 randomly selected request forms (see next page) was collected and coded. From the sample it was possible to estimate total requests for July 89 to March 90 to be about 1,300 (494 brief, 675 detailed, 131 in-depth). At times judgment was used by us to distinguish between categories of searches. The sample was coded and tabulated by type of request (brief, detailed, in-depth); type of search (online; INFOTRAC, CD-ROM, other or none); type of response (bibliographic citation, answer, SL book, photocopy, OCLC, referral, ILL; other sources PPL, ASU, other); staff member who handled the request duration of request (turn around time in days); time of search (in minutes); and other (withdrawn x info, rush, fax, telephone call). Description of SRC searches are given below.

The types of request received include:

o	Answers to brief questions and simple subject requests	38.0%
o	Detailed questions	51.9%
o	In-depth questions (often requiring online searches)	10.1%

Sometimes more than one type of search is performed. The types of searches done include:

o	InfoTrac	45.0%
o	Other online (e.g., Dialog)	21.7%
o	CD-ROM	0.8%
o	Other (incl. manual)	48.8%

Other resources were used on occasion such as the Phoenix Public Library (27.1% of requests), Arizona State University (2.3% of requests) and other resources such as experts, State Library staff and so on (14.7% of requests). Such other resources were used to support searching and to provide identified items (i.e., books, photocopies, etc.) to the requestors.

Types of response include:

o	Bibliographic citations	24.8%
o	Answers to question	14.7%
o	Loaned books for the State (1.9 books per relevant requests)	12.4%
o	Other ILL (2.0 books per relevant requests)	26.4%
o	Photocopies (1.7 photocopies per relevant request)	47.3%
o	Referrals elsewhere	8.5%
o	Withdrawals/non-response	2.3%

The average response time is estimated to be 6.6 days which varies by type of request as follows:

o	Answers to brief questions and simple subject requests	5.2 days
o	Detailed questions	7.3 days
o	In-depth question	7.8 days

When other sources were used the response times increased an average of about three days (9.6 days using PPL, 12.0 days using ASU, and 10.2 days using other resources).

E.3 COST OF SEARCHES BY SRC

Special analysis of State Reference Center (SRC) Services involved cost finding of specific functions performed by SRC staff. The steps for analyzing the cost of searches were:

- o We made rough estimates by asking staff members the time they spent doing various daily activities (input processing, output processing, searching, administration and other).
- o Total searches were estimated for July 1, 1989 - March 1990.
- o We then calculated time spent searching by each staff member on different types of requests. These data we obtained from the sample of 129 searches.
- o Total and average personnel costs of searching were estimated for brief, detailed and in-depth searches.
- o Other direct costs and overhead costs were applied to direct labor costs to determine overall average and total costs of searches.

Staff members were asked to estimate the amount of time spent on input processing, searching, output processing, administration and other. The time was converted to salary expenses as follows:

SRC PERSONNEL COSTS (YTD)

Staff Member	Total (\$)	Input Proc. (\$)	Searching (\$)	Output Proc. (\$)	Admin. (\$)	Other (\$)
1	\$21,536	---	\$6,730	---	\$11,576	\$3,230
2	15,993	---	12,590	---	500	2,903
3	3,256	---	3,250	---	---	---
4	8,477	\$2,119	1,590	3,708	1,060	---
5	1,390	---	1,390	---	---	---
Total	\$50,646	\$2,119	\$25,550	\$3,708	\$13,136	\$6,133

SOURCE: King Research, Inc. Cost Finding

Calculations were then made to find out what proportion of time the staff members spend conducting each type of search. These estimates were made by examining the time reported by searches on the search forms. The results are below.

SEARCHING (TYPE OF REQUEST)

Staff Member	<u>Brief</u>		<u>Detailed</u>		<u>In-depth</u>		Total
	Time	Proportion	Time	Proportion	Time	Proportion	
1	180	30.2	230	38.7	185	31.1	595
2	677	29.3	1,465	63.4	170	7.3	2,312
3	210	31.1	455	67.4	10	1.5	675
4	180	29.0	210	33.9	230	37.1	620

SOURCE: King Research, Inc.

The cost of each type of search is calculated by multiplying the proportion above times the costs of searching above. For example, the cost of brief searching by staff member 1 is \$6,730 times 0.302 = \$2,032. The remaining costs are summarized below. Note that from the staff member time allocation estimate we know that one staff member was doing some searching, but this was not noted elsewhere in the raw data, therefore calculations by type of request could not be made. It was assumed that the person only did brief searches.

YTD COST OF SEARCHES (TYPE OF REQUEST)

Searcher	Brief	Detailed	In-depth	Total
1	\$2,032.46	\$2,604.51	\$2,093.03	\$ 6,730
2	3,688.87	7,982.06	919.07	12,590
3	1,010.75	2,190.50	48.75	3,250
4	403.10	471.21	515.69	1,390
5	1,590.00	-----	-----	1,590
Total	\$8,725.18	\$13,248.28	\$3,576.54	\$25,550

To find average cost of searches by type of request, the total cost of searches was divided by the number of searches (brief = \$17.66 per search, detailed = \$19.63, in-depth = \$27.30). Then average the input and output processing cost was calculated \$4.48 per search (\$2,119 + \$3.708) divided by (1,300) and added to average cost for the total direct labor cost per search. Direct labor costs, other direct costs and administrative costs were totaled and divided by direct labor to reach the overhead factor (2.99). Average direct labor cost and overhead factor gives the total average cost. Average cost by type of search is summarized below.

Type of Search	Total Searches	Avg. of Search	Avg. Cost Direct Labor	Total Avg. cost of Searches
Brief	494	\$17.66	\$22.14	\$66.25
Detailed	675	19.63	24.11	72.15
In-depth	131	27.30	31.78	95.10
Total	1,300	19.65	24.13	72.15

The expected and actual average search time and duration by staff member was calculated by multiplying the average time per search by type of request with the number of requests each searcher had. Results are summarized below.

SEARCHING TIME AND DURATION

Staff Member	<u>Time (mins.)</u>		<u>Duration (days)</u>	
	Actual Average	Expected Average	Actual Average	Expected Average
1	34.05	36.27	7.81	6.88
2	28.65	32.52	5.11	6.57
3	52.00	34.38	10.29	6.91
4	35.00	33.88	8.35	6.62